ANTI-LOCK BRAKE SYSTEM (ABS) AND ANTI-LOCK BRAKE SYSTEM WITH ELECTRONIC DIFFERENTIAL LOCK (ABS/EDL) ITT MARK 20 IE, VEHICLES UP TO 09.00

GENERAL

ABS layout (left-hand drive vehicle)

The ABS or ABS/EDL brake system is divided diagonally. Brake pedal pressure is boosted pneumatically by a vacuum brake booster.

Vehicles with ITT Mark 20 IE ABS do not have a mechanical brake pressure regulator. The control module controls the rear axle brake pressure regulation.

Malfunctions of the ABS or ABS/EDL systems do not influence conventional braking or the vacuum brake booster. The conventional braking system remains functional if the ABS is not operating.

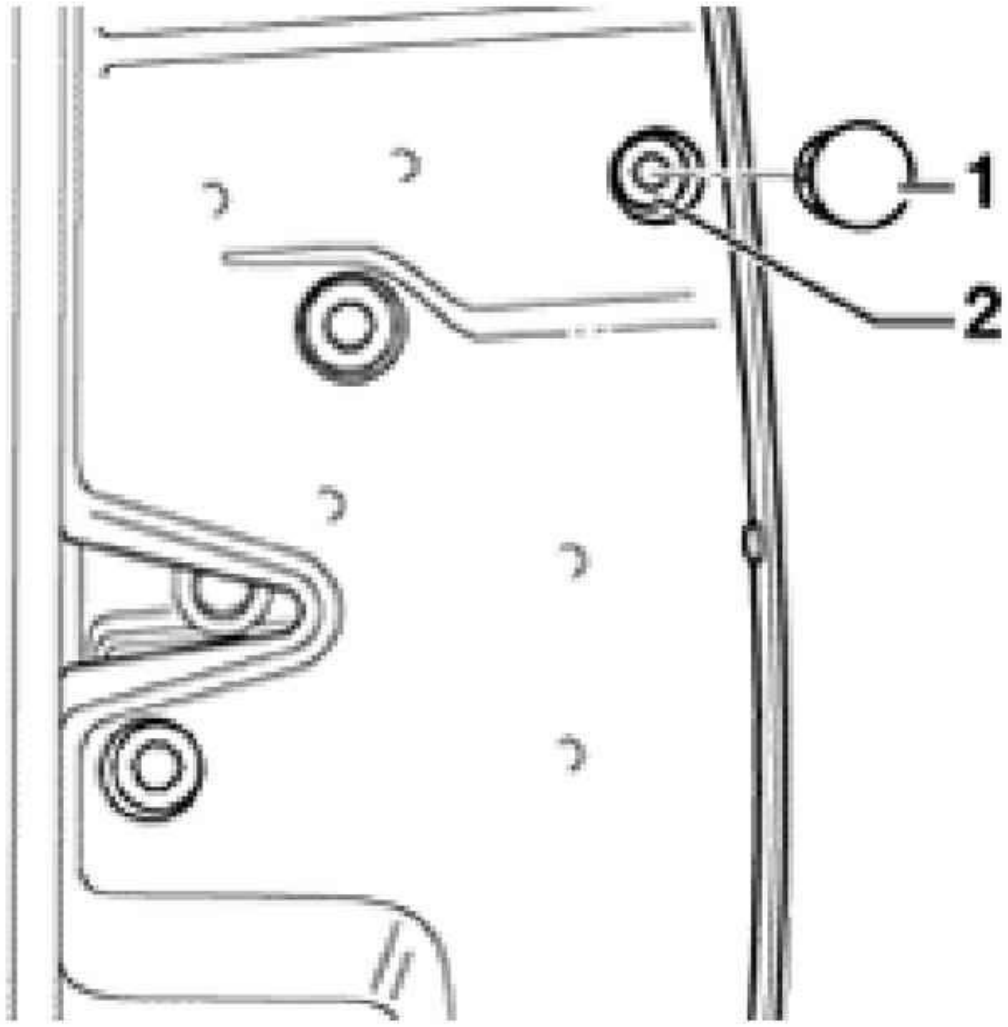


Fig. 1: Identifying ABS Layout - ITT Mark 20 IE (Left-Hand Drive Vehicle)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

The hydraulic part -a- and control module part -b- form one unit. They can only be separated when removed from the vehicle.

New control modules (replacement parts) are not coded and must be coded after installation.

Before working on the ABS or ABS/EDL, determine the cause of the malfunction using the On Board Diagnostic (OBD) program.

See **ON BOARD DIAGNOSTIC (OBD), INITIATING** .

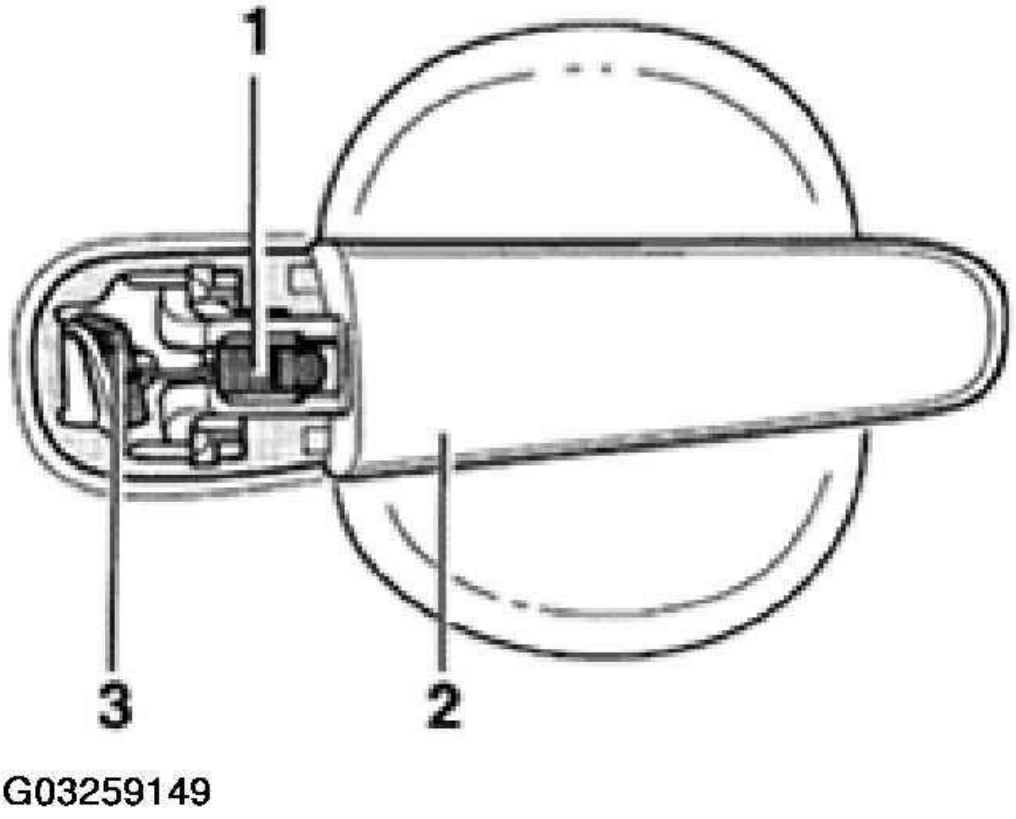


Fig. 2: Identifying Hydraulic Part And Control Module - ITT Mark 20 IE
Courtesy of VOLKSWAGEN OF AMERICA, INC.

DIFFERENCES BETWEEN ABS ITT MARK 20 IE AND ABS/EDL ITT MARK 20 IE

I. **I - ABS - ITT Mark 20 IE**

   Dimension a = 100 mm (3.9 in.)

II. **II - ABS/EDL - ITT Mark 20 IE**

   Dimension a = 130 mm (5.1 in.)

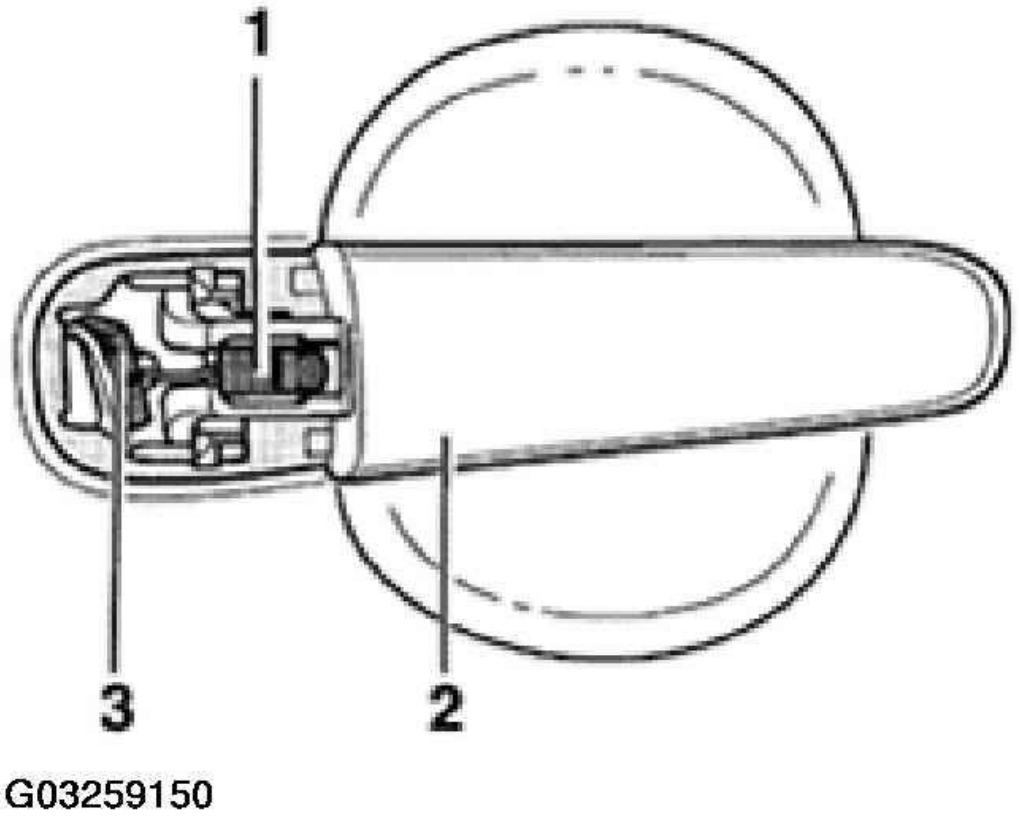


Fig. 3: Identifying Dimension ABS ITT Mark 20 IE and ABS/EDL ITT Mark 20 IE
Courtesy of VOLKSWAGEN OF AMERICA, INC.

SAFETY PRECAUTIONS

WARNING:

- **Brake fluid is poisonous.**

CAUTION:

- **Before working on ABS or ABS/EDL system, obtain the radio code before disconnecting battery ground strap.**
- **Brake fluid must not contact painted parts.**
- **Brake fluid absorbs moisture from the air and must be replaced every two years. Use only new, and unused approved brake fluid that complies with MVSS 116 DOT4.**
- **Do not use silicone-based brake fluid (DOT 5). Even the smallest**

traces can cause severe corrosion in the brake system.

- Before doing any electric welding on the car, disconnect the ABS control module.
- After work that requires opening the brake hydraulic system, bleed the system after completion of the repairs.
- During the final road test make at least one controlled brake test where the brake pedal is felt to pulsate (ABS operation).

CAUTION:

- Absolute cleanliness is required when working on the ABS or ABS/EDL system. Do not use any products that contain mineral oil such as oil, greases, etc.
- Thoroughly clean all connections and the area immediately around them before loosening. Do not use aggressive cleaning agents such as brake cleaner, gasoline or thinners.
- Place removed parts on a clean surface and cover them. Only use clean plastic covering or paper. Do not use rags that may contain lint.
- Carefully seal or cover opened components if repairs cannot be completed right away.
- After separating the control module from the hydraulic unit, use the transportation protection for the valve dome.
- Only install replacement parts from original packaging. Only remove the parts from the package immediately before installation.

CAUTION:

- Do not work with compressed air nearby whenever the hydraulic system is open. Do not move the vehicle with the hydraulic system open.
- Be very careful not to let any brake fluid enter any wiring harness connectors.
- Do not re-use fasteners that are worn or deformed from normal use.
- Some fasteners are designed to be used only once and are unreliable and may fail if used a second time. This includes but is not limited to nuts, bolts, washers, clamps, circlips and cotter pins. Always follow the recommendations in this manual. Replace these fasteners with new parts where indicated and any other time it is deemed necessary by inspection.

HYDRAULIC UNIT, BRAKE BOOSTER/MASTER CYLINDER, OVERVIEW, VEHICLES UP TO 09.00

CAUTION: Before working on the brake system, read CAUTIONS and WARNINGS in SAFETY PRECAUTIONS .

NOTE: Complete master cylinders and brake boosters can be replaced separately.

NOTE: The following list refers to items in Fig. 4 .

1. **Brake booster**
   - On gasoline engines vacuum is taken from the intake manifold.
   - Diesel engines have a vacuum pump to create the required vacuum.

     Functional check:

     - With engine switched off, depress brake pedal firmly several times (to exhaust the vacuum in the unit).
     - Depress brake pedal with average foot pressure, hold and start engine. If brake booster is working properly, the pedal will be felt to give slightly under foot (booster assistance becomes effective).
   - If pedal does not give, replace brake booster.
   - Check valve (in vacuum hose)

     Functional check. See **VACUUM CHECK VALVE** .

   - Separating from brake pedal. See **BRAKE BOOSTER** .
   - Removing and installing. See **BRAKE BOOSTER** .
2. **Cap**
3. **Brake fluid reservoir**
4. **Sealing plug**
   - Moisten with brake fluid and press into reservoir
5. **Retainer pin**
   - Insert through brake master cylinder
6. **Brake master cylinder**
   - Cannot be repaired. If faulty, replace as complete unit
7. **Self-locking nut**
   - 20 N.m (15 ft. lb)
   - Always replace
8. **Bolt**
   - 9 N.m (80 in. lb)
9. **Cap nut**
   - 9 N.m (80 in. lb)
10. **ABS/EDL hydraulic unit**

11. **ABS control module**
12. **Brake line connection**
    - Hydraulic unit to left front brake caliper
13. **Brake line connection**
    - Hydraulic unit to right rear wheel cylinder/caliper
14. **Brake line connection**
    - Hydraulic unit to left rear wheel cylinder/caliper
15. **Brake line connection**
    - Hydraulic unit to right front brake caliper
16. **Brake line**
    - Brake master cylinder/primary piston circuit to hydraulic unit
17. **Brake line**
    - Master brake cylinder/secondary piston circuit to hydraulic unit
18. **Self-locking nut**
    - 20 N.m (15 ft. lb)
    - Always replace
19. **Heat shield**
    - Only for vehicles with 110 kW engine
20. **Self-locking nut**
    - 20 N.m (15 ft. lb)
    - Always replace
21. **Seal**
    - Always replace
22. **Seal**
23. **Vacuum hose**
    - Insert into brake booster
24. **Gasket**
    - For brake booster
25. **Self-locking nut**
    - 20 N.m (15 ft. lb)
    - Always replace
26. **Boot**
    - Be sure boot is properly seated.
27. **Bracket**

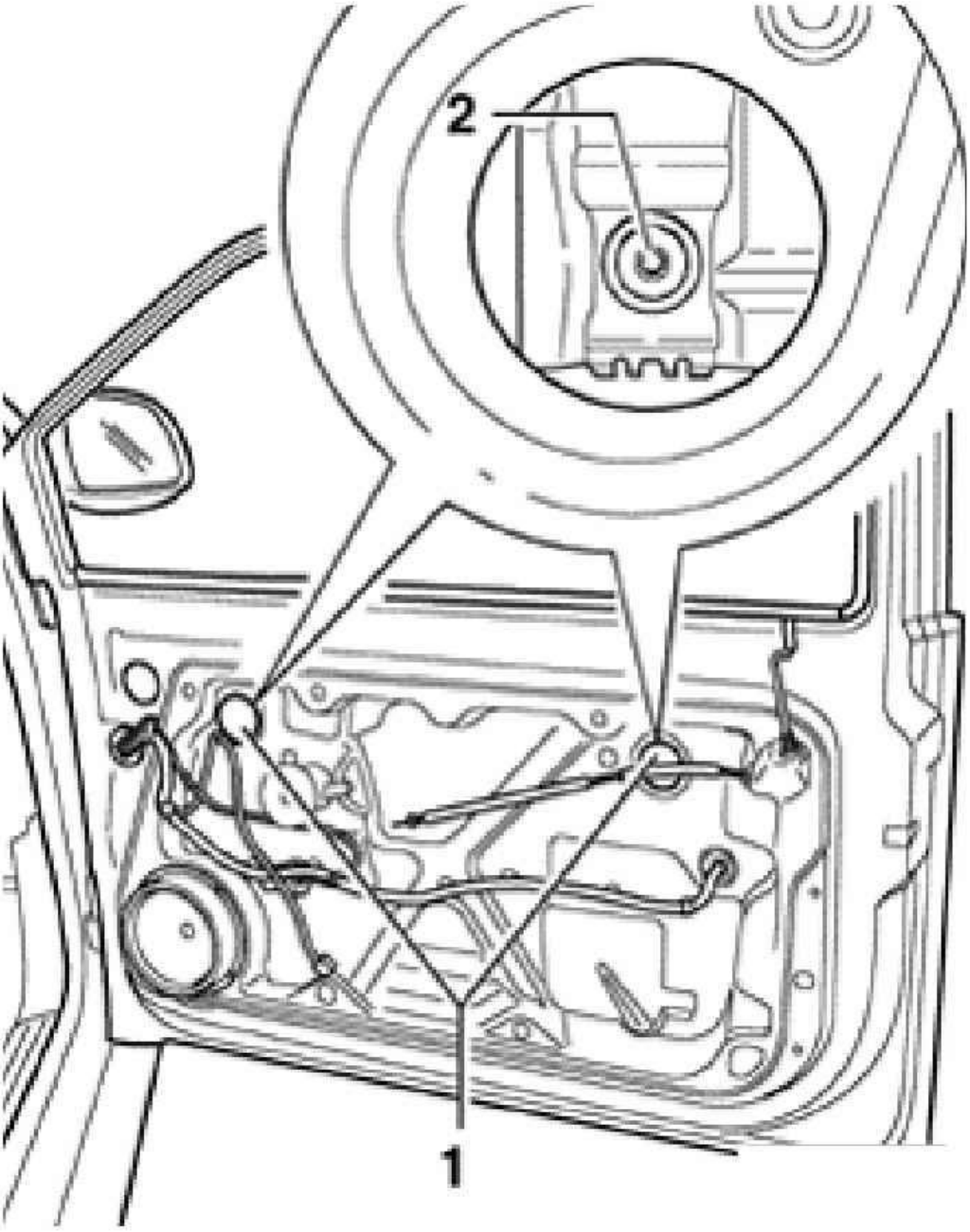


Fig. 4: Identifying Hydraulic Unit, Brake Booster/Master Cylinder Component - ITT Mark 20 IE
Courtesy of VOLKSWAGEN OF AMERICA, INC.

BRAKE LINES FROM BRAKE MASTER CYLINDER TO HYDRAULIC UNIT, CONNECTING

NOTE: The following list refers to items in Fig. 5 .

A. A - Secondary piston circuit
B. B - Primary piston circuit

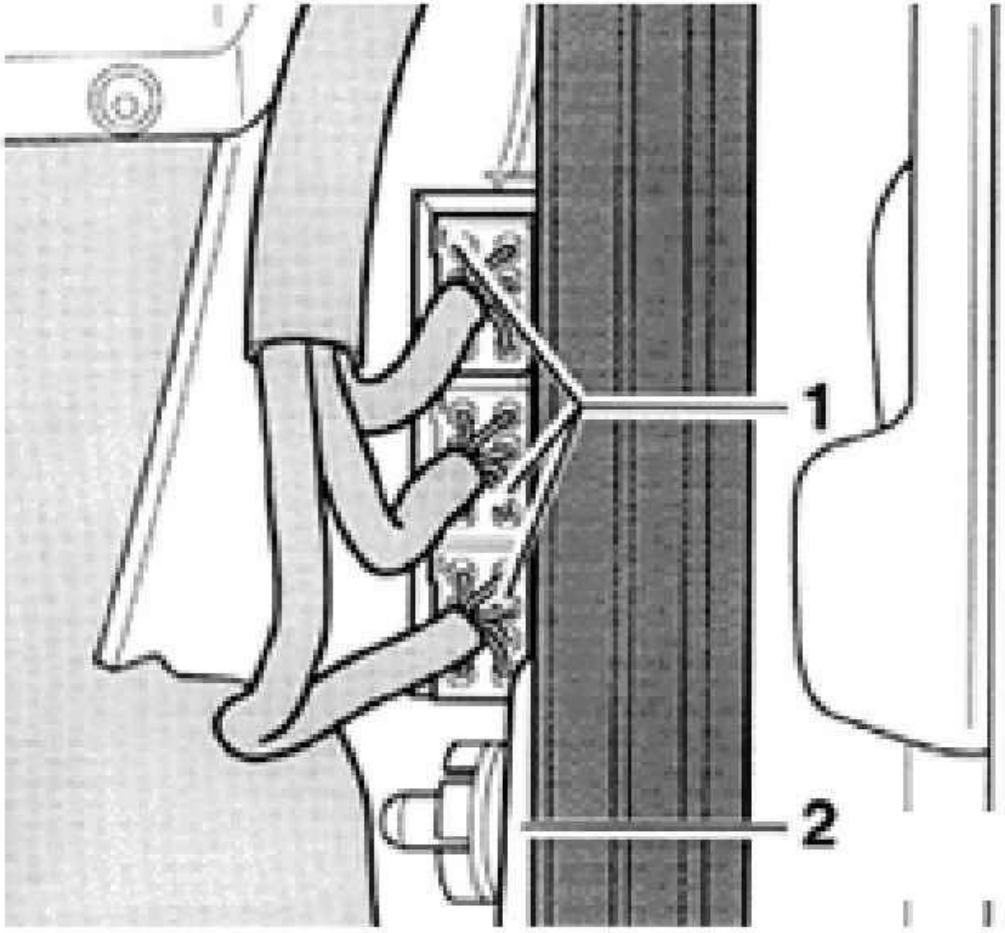


Fig. 5: Identifying Vehicles With ABS - ITT Mark 20 IE
Courtesy of VOLKSWAGEN OF AMERICA, INC.

1. Hydraulic unit to right front brake caliper

2. Hydraulic unit to left rear wheel cylinder/brake caliper
3. Hydraulic unit to right rear wheel cylinder/brake caliper
4. Hydraulic unit to left front brake caliper

NOTE: The following list refers to items in Fig. 6 .

A. Secondary piston circuit
B. Primary piston circuit

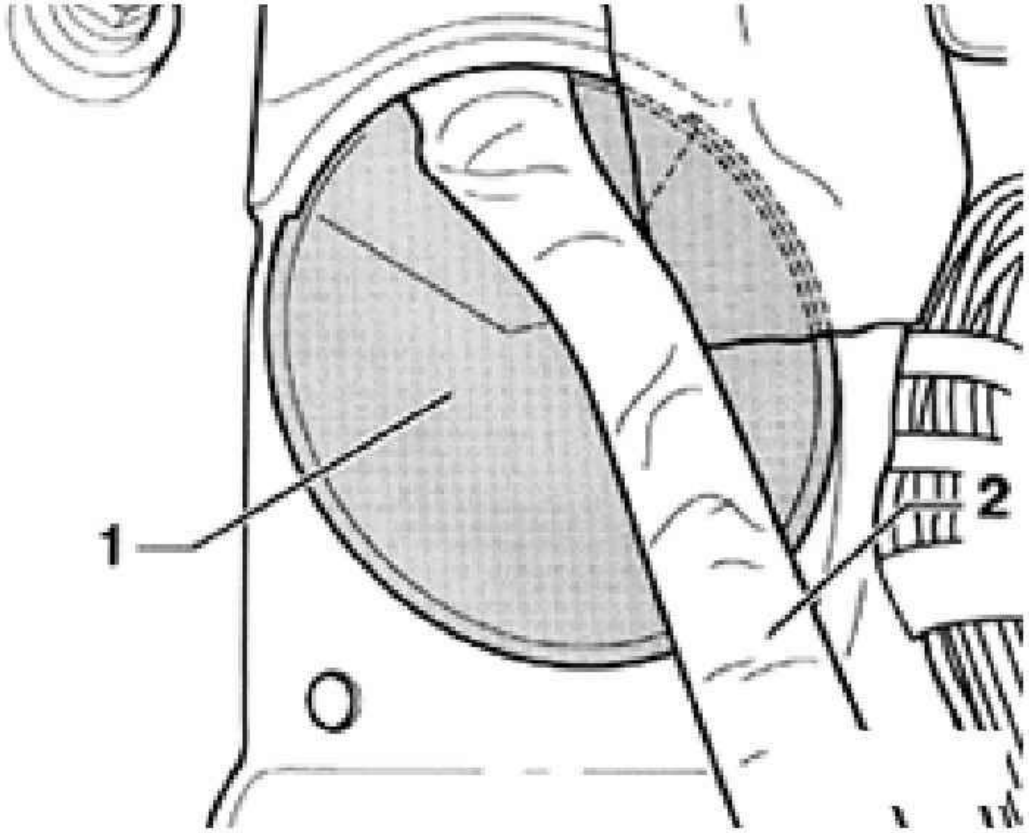


Fig. 6: Identifying Vehicles With ABS/EDL - ITT Mark 20 IE
Courtesy of VOLKSWAGEN OF AMERICA, INC.

ABS CONTROL MODULE AND HYDRAULIC UNIT, REMOVING AND INSTALLING

Special tools and equipment:

- VAG 1331 Torque wrench or equivalent

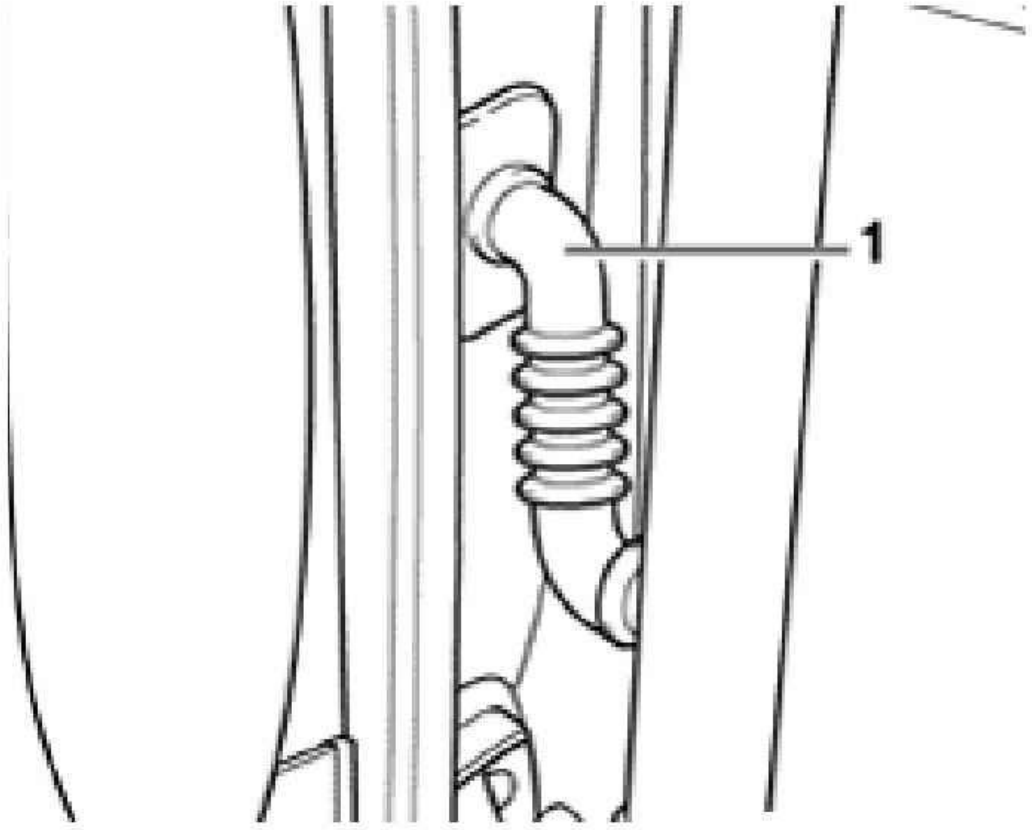


Fig. 7: Identifying VAG 1331 Torque wrench
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- VAG 1410 Torque wrench or equivalent

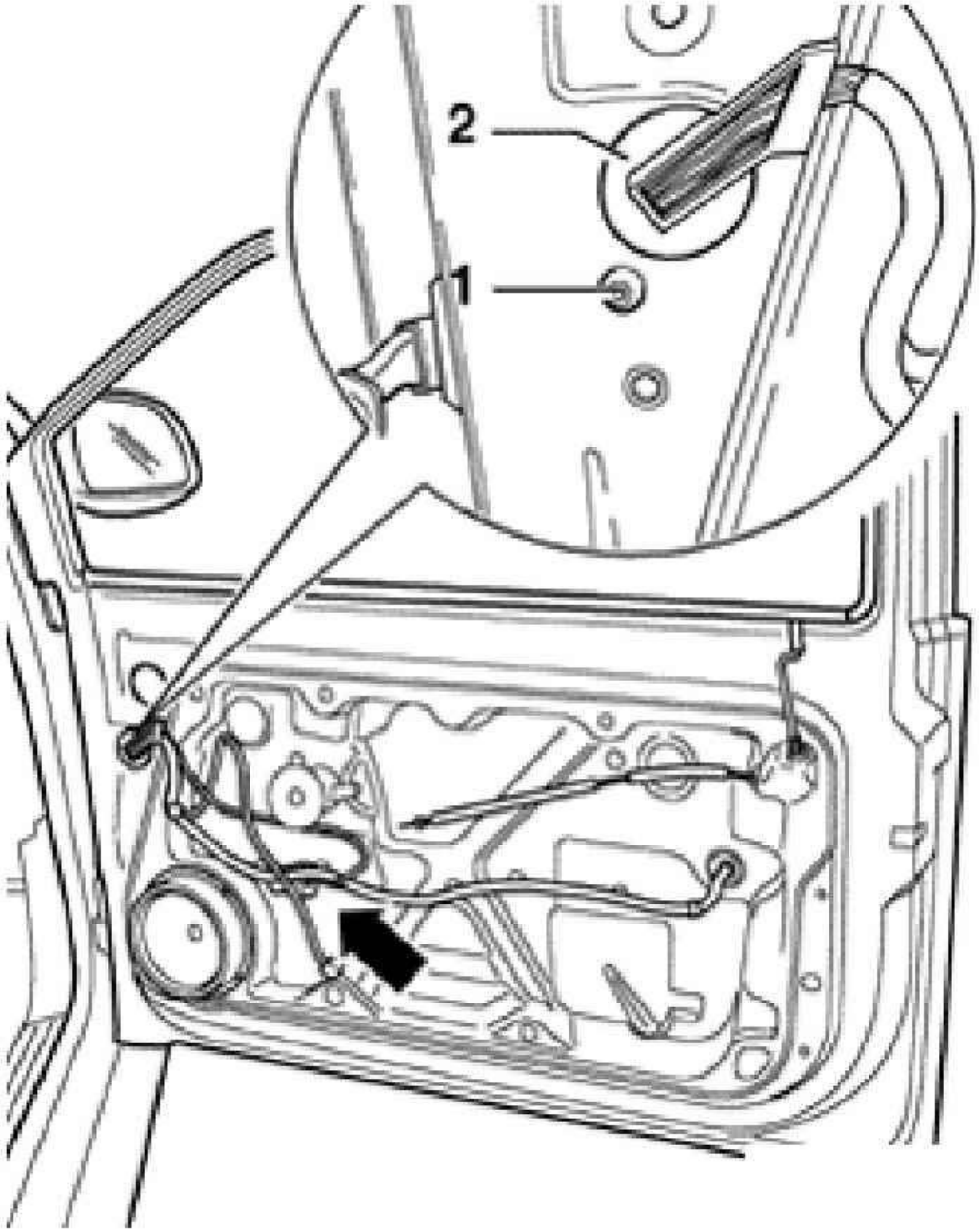


Fig. 8: Identifying VAG 1410 Torque Wrench
Courtesy of VOLKSWAGEN OF AMERICA, INC.

CAUTION: Before working on any part of the brake system, read CAUTIONS and WARNINGS in SAFETY PRECAUTIONS .

Location

The control module is attached to the hydraulic unit and is located on the left side of the engine compartment.

CAUTION: Do not bend brake lines at the hydraulic unit.

Removing

- Obtain radio code for vehicles with coded radio.
- Disconnect battery.
- Remove intake hose -1- and connector -2- from Mass Air Flow (MAF) Sensor.

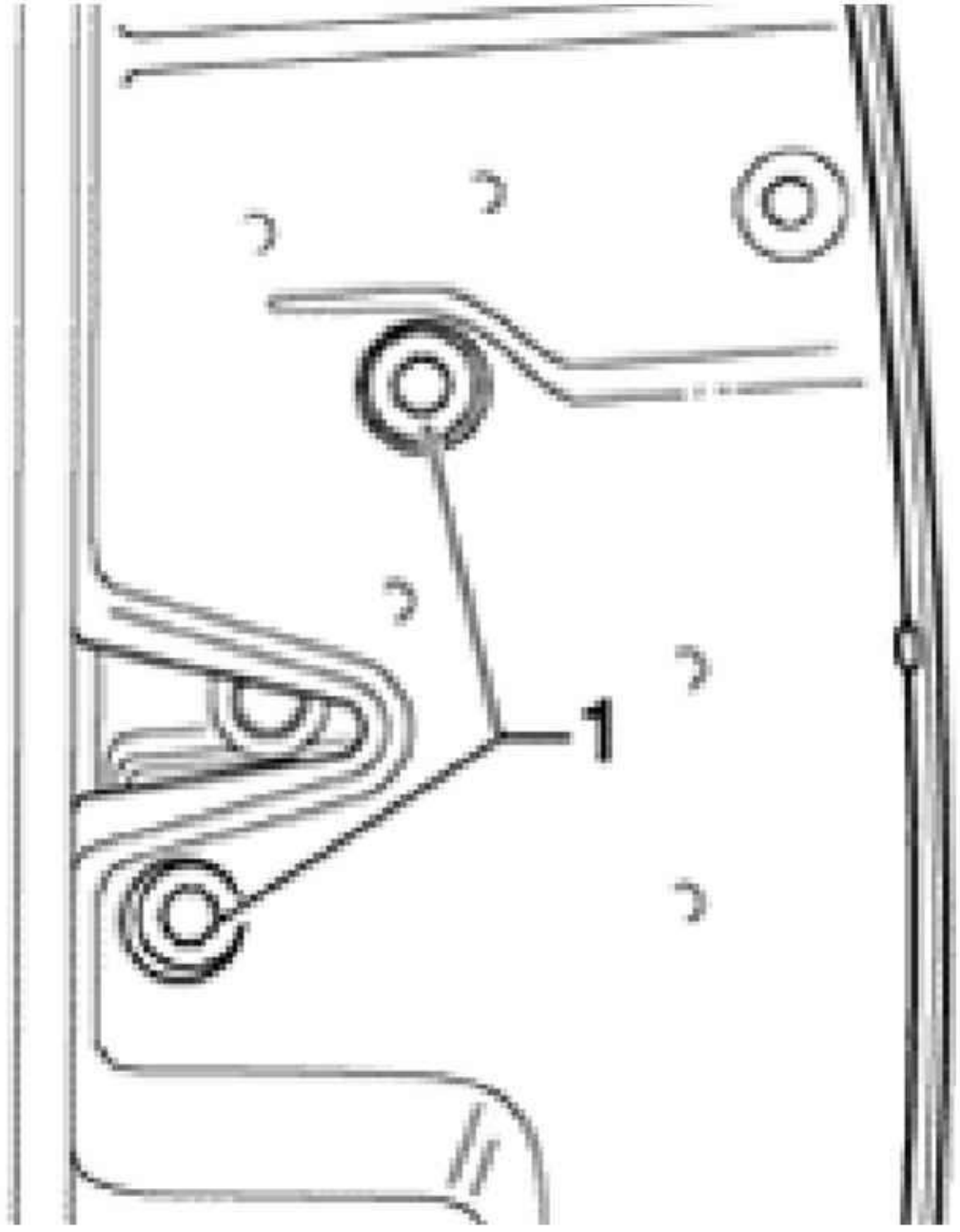


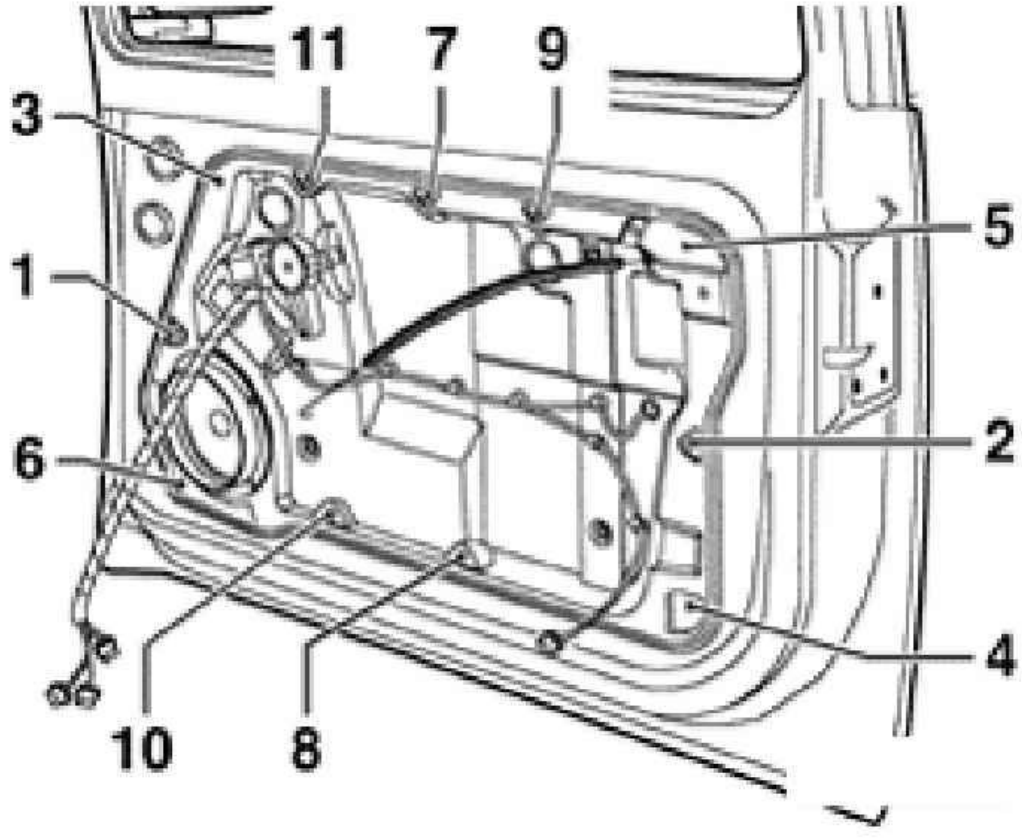
Fig. 9: Removing Intake Hose And Connector From Mass Air Flow Sensor
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Remove bolts -4- and -5-.
- Remove air cleaner as complete unit.
- For vehicles with Diesel engines, remove relay panel above brake booster.

WARNING:

- **Brake fluid is poisonous.**
- **To draw off brake fluid from the reservoir use a bleeder bottle used only for brake fluid. Never siphon brake fluid by mouth.**

- Remove as much brake fluid as possible from brake fluid reservoir using a bleeder bottle.
- Install brake pedal depressor from VAG 1238 B or equivalent.
- Connect bleeder bottle hose to left front brake caliper bleeder screw and open bleeder screw. Close bleeder screw.
- Release control module connector (arrow -1-) and disconnect (arrow -2-).



G03259157

Fig. 10: Releasing Control Module Connector
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Place plastic covering under control module and hydraulic unit. Do not use rags.

CAUTION: Do not let brake fluid enter electrical connectors.

Observe safety precautions; see **SAFETY PRECAUTIONS** .

- Disconnect brake lines from hydraulic unit to brake master cylinder (arrows) and suspend with wire.

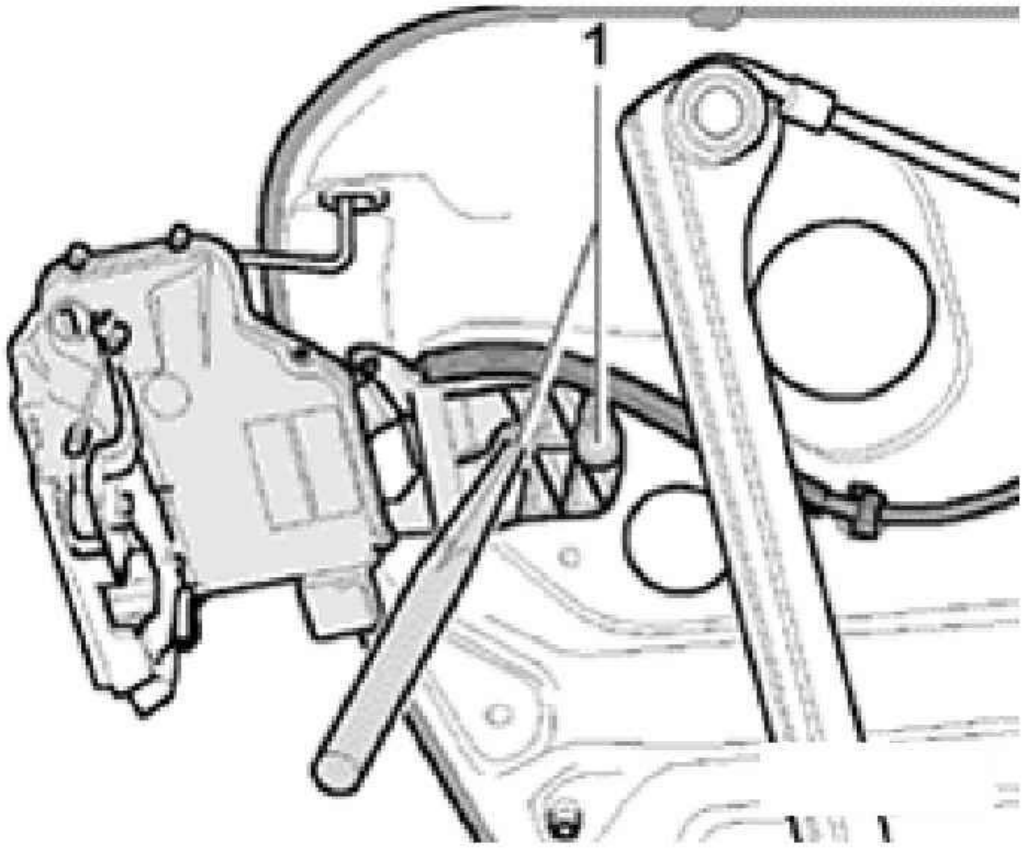


Fig. 11: Disconnecting Brake Lines From Hydraulic Unit To Brake Master Cylinder And Suspend With Wire
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Disconnect remaining brake lines on hydraulic unit.
- Seal brake lines and threaded holes (arrows) with plugs from repair kit, Part No. 1H0 698 311 A.
- Remove bolts on hydraulic unit bracket (arrows).

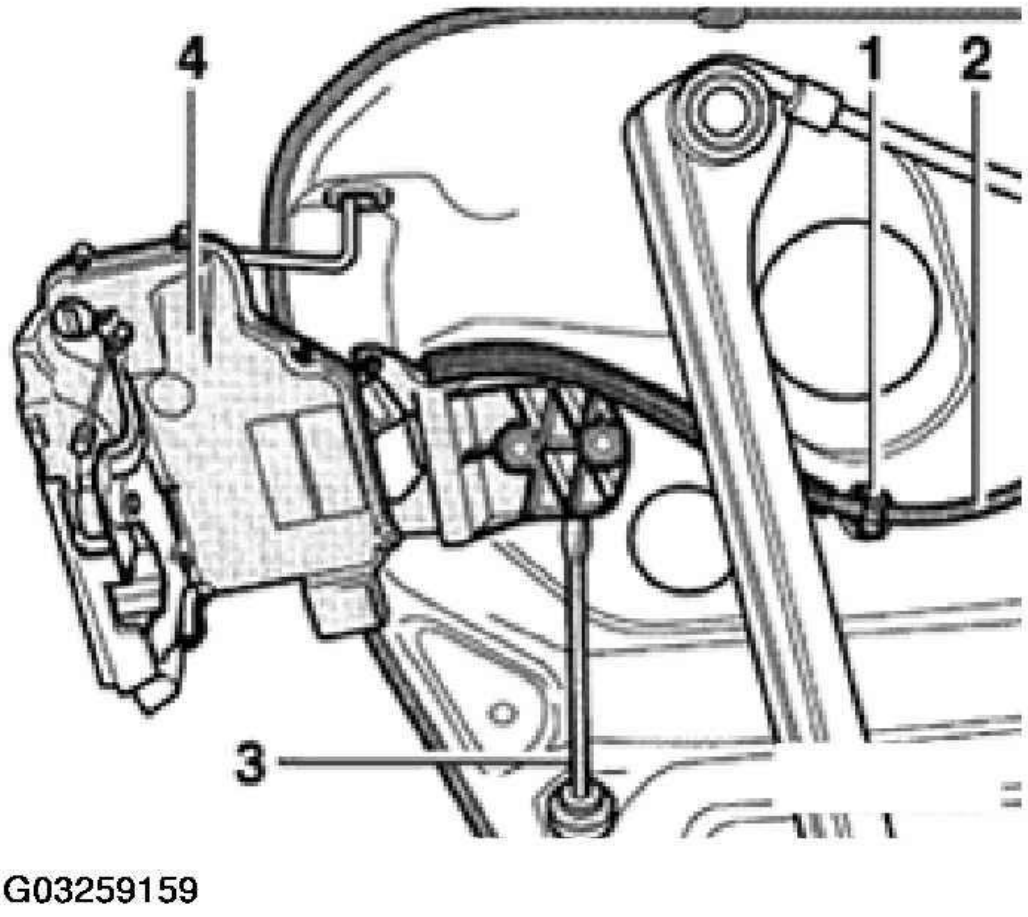


Fig. 12: Removing Bolts On Hydraulic Unit Bracket
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Remove hydraulic unit with control module.

ABS control module, removing from hydraulic unit

- Disconnect electrical connector for hydraulic pump motor from control module.
- Remove bolts (arrows) from control module.

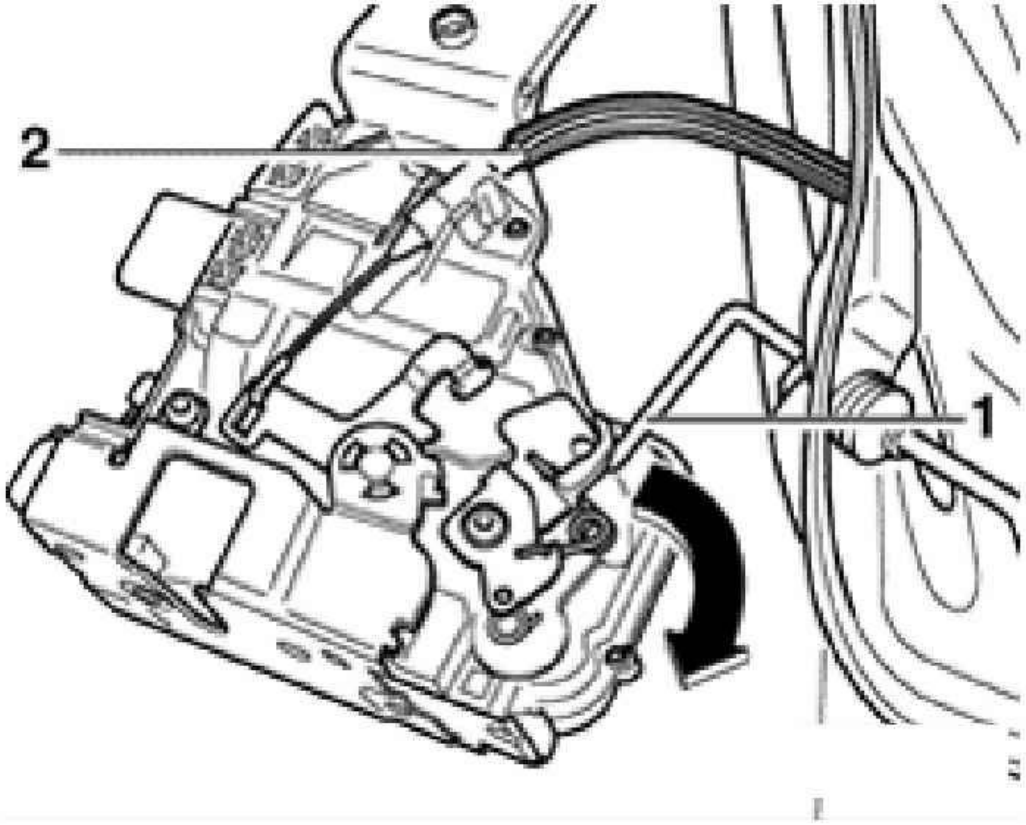


Fig. 13: Removing Bolts From Control Module
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Pull control module straight up to remove.

NOTE:

- **Be sure that the hydraulic unit valve dome is not tilted against the control module solenoid valves.**
- **Cover the control module magnetic coils with a plastic covering. Do not use rags.**
- **After separating the control module and hydraulic unit, use transportation protection for the valve dome.**

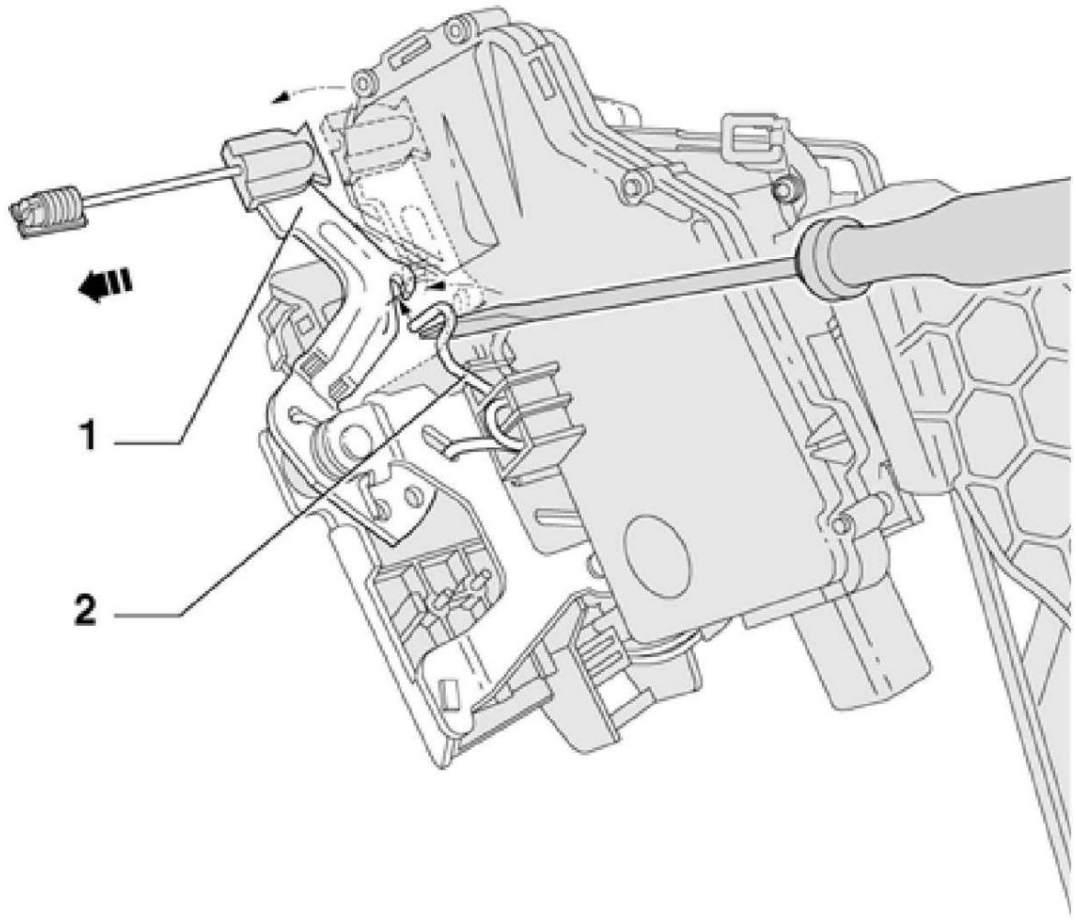


Fig. 14: Pulling Control Module Straight Up To Remove
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Installing

CAUTION:

- **Only remove sealing plugs on the new hydraulic unit just before installing the corresponding brake line.**
- **If the sealing plugs are removed too early, brake fluid can escape. It can no longer be guaranteed that the unit is sufficiently filled or adequately bled.**
- **When assembling the control module and hydraulic unit, be sure that the hydraulic unit valve dome is not tilted against the control module solenoid valves.**

- Using new bolts, install control module to hydraulic unit. Do not tighten more than max. 4 N.m (35 in.

lb).

- Re-connect electrical connector for hydraulic pump motor.
- Install ABS unit to bracket.

NOTE: Hand-tighten bolts to make attaching individual brake lines easier.

- After tightening brake lines, tighten hydraulic unit.
- Continue installation in reverse order of removal.
- Bleed brake system. See **BLEEDING BRAKE SYSTEM** .
- Enter radio code.
- Code control module

See **CODE CONTROL MODULE (FUNCTION 07)** .

Tightening torques:

Control module to hydraulic unit : max. 4 N.m (35 in. lb)

Hydraulic unit bolt to bracket : 8 N.m (71 in. lb)

Nut for brake master cylinder to brake booster : 20 N.m (15 ft. lb)

Brake lines to ABS unit:

Thread M10 x 1 : 15 N.m (11 ft. lb)

Thread M12 x 1 : 15 N.m (11 ft. lb)

Nut to body : 20 N.m (15 ft. lb)

Cap nut to body : 20 N.m (15 ft. lb)

ABS SYSTEM COMPONENTS FOR FRONT AXLE, REMOVING AND INSTALLING

CAUTION: Before working on the brake system, read CAUTIONS and WARNINGS on SAFETY PRECAUTIONS .

NOTE: Removing and installing ABS system parts is identical for FS III and FN 3 brake calipers.

NOTE: The following list refers to items in Fig. 15 .

1. **ABS wheel speed sensor**
    - Before inserting sensor, clean hole and coat with grease, Part No. G 000 650
2. **Wheel bearing housing**
3. **Socket-head bolt**
    - 8 N.m (71 in. lb)
4. **Splash shield**
5. **Bolt**
    - 10 N.m (7 ft. lb)
6. **Wheel bearing**
    - Replace each time after removing
    - Removing and installing

    See **WHEEL BEARING (WHEEL BEARING HOUSING INSTALLED IN VEHICLE)** .

7. **Phillips screw**
8. **Brake disc**
9. **Wheel hub with ABS wheel speed sensor rotor**
    - Removing and installing

    See **WHEEL BEARING (WHEEL BEARING HOUSING INSTALLED IN VEHICLE)** .

10. **Circlip**

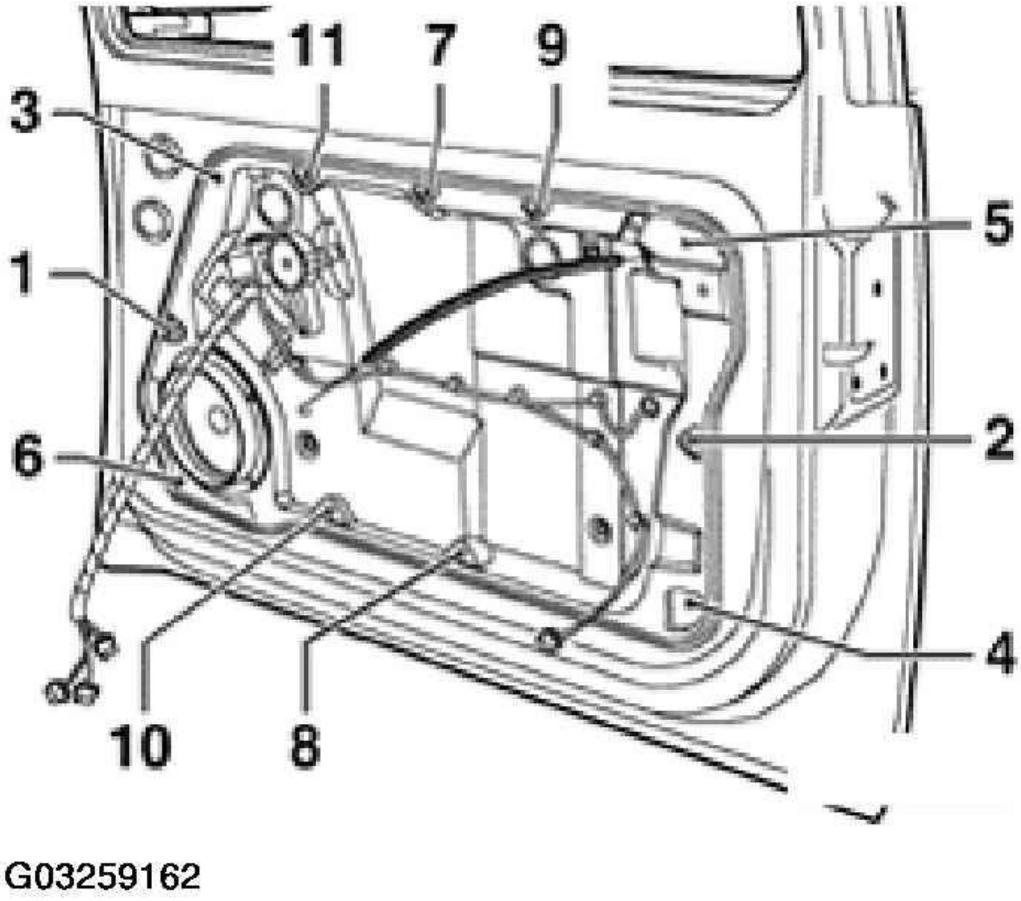


Fig. 15: Identifying ABS System Components For Front Axle
Courtesy of VOLKSWAGEN OF AMERICA, INC.

ABS WHEEL SPEED SENSOR FOR FRONT AXLE, REMOVING AND INSTALLING

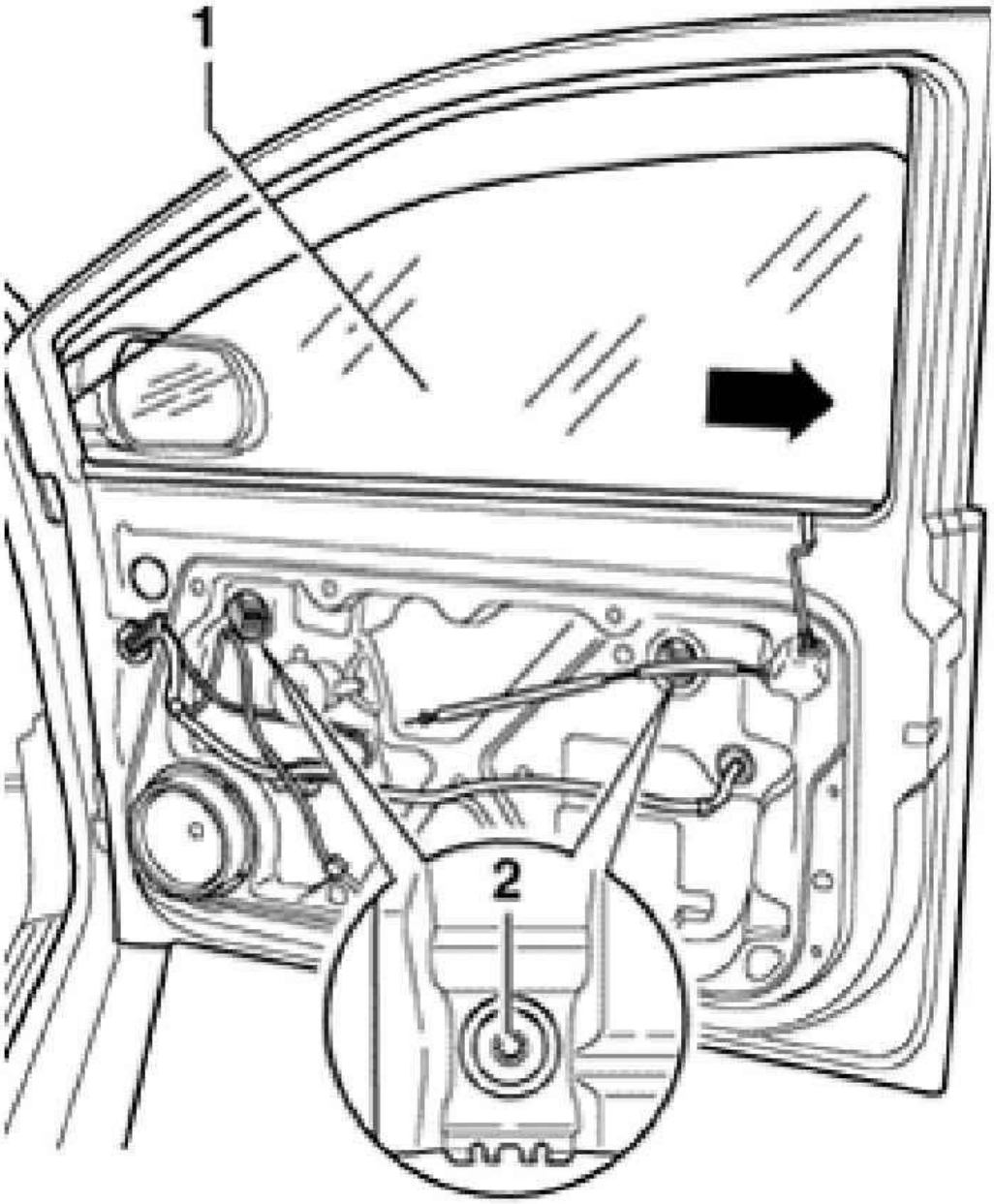
Removing

- Raise vehicle.
- Disconnect connector for wheel speed sensor and speed sensor wiring -1-.
- Remove bolt -2- from wheel bearing housing.
- Remove ABS wheel speed sensor from wheel bearing housing.

Installing

- Before inserting wheel speed sensor, clean hole and coat speed sensor with grease, Part No. G 000 650.

- Insert wheel speed sensor into hole in wheel bearing housing and tighten bolt to 8 N.m (71 in. lb).
- Connect wheel speed sensor to speed sensor wiring.
- Turn wheels fully to left and right lock and check clearance of speed sensor wiring.



G03259163

Fig. 16: Disconnecting Connector For Front Wheel Speed Sensor And Speed Sensor Wiring
Courtesy of VOLKSWAGEN OF AMERICA, INC.

ABS wheel speed sensor gap, checking

- Raise vehicle.
- Remove wheel.
- Rotate brake disc and check whether wheel speed sensor rotor is damaged or dirty.
- If rotor is damaged, remove wheel hub with rotor and replace

See **WHEEL BEARING (WHEEL BEARING HOUSING INSTALLED IN VEHICLE)** .

Rotor runout, checking

- Raise vehicle.
- Remove wheel.
- Turn wheel hub and measure distance between rotor and speed sensor, dimension -a-, all around.
  - dimension -a- = 0.3 mm (0.0118 in.)
- If rotor is not true, remove wheel hub with rotor and replace.

See **WHEEL BEARING (WHEEL BEARING HOUSING INSTALLED IN VEHICLE)** .

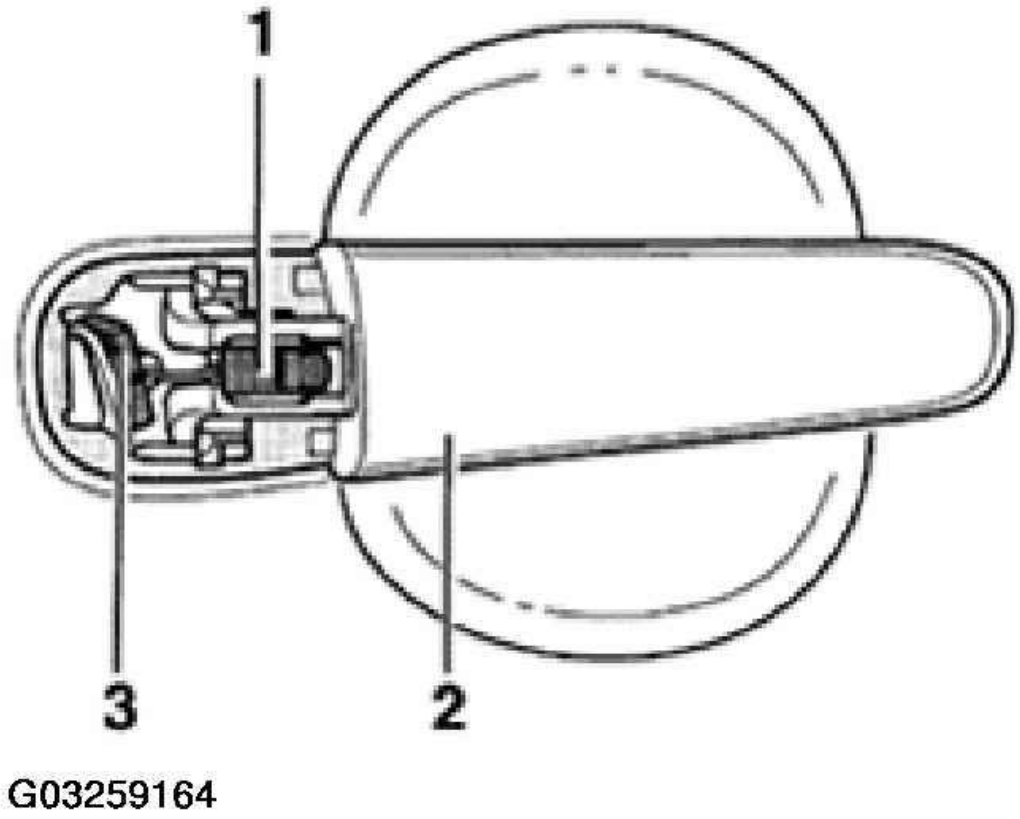


Fig. 17: Measuring Distance Between Rotor And Speed Sensor
Courtesy of VOLKSWAGEN OF AMERICA, INC.

FRONT WHEEL SPEED SENSOR WIRING, REMOVING AND INSTALLING

Special tools and equipment

- VAS 1978 wiring repair kit

Removing:

- Obtain radio code on vehicles with coded radio.
- Disconnect battery.

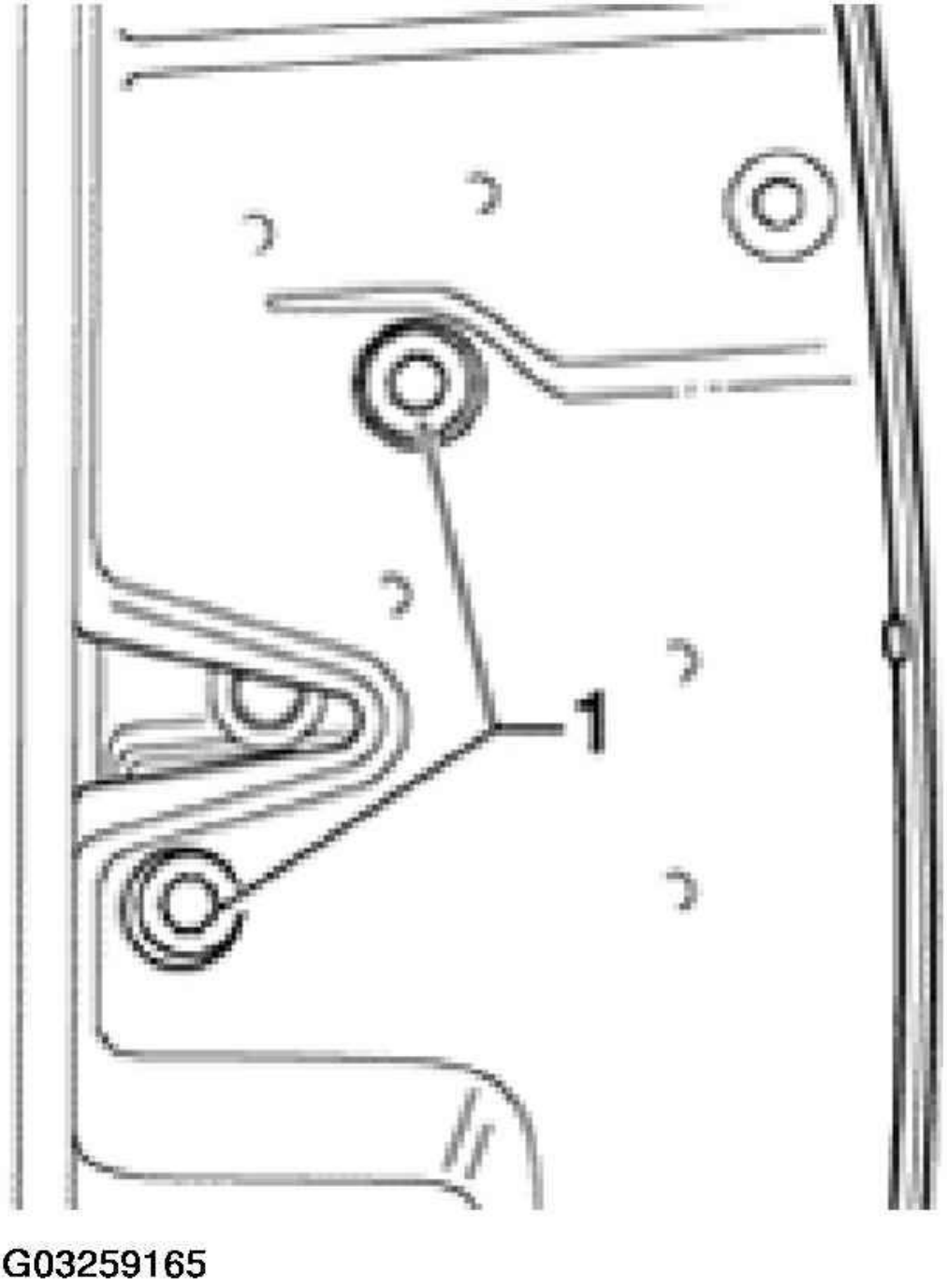


Fig. 18: Identifying VAS 1978 Wiring Repair Kit
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Pull off intake hose -1- and connector -2- from Mass Air Flow (MAF) sensor.
- Remove bolts -4- and -5-.
- Remove air cleaner unit.

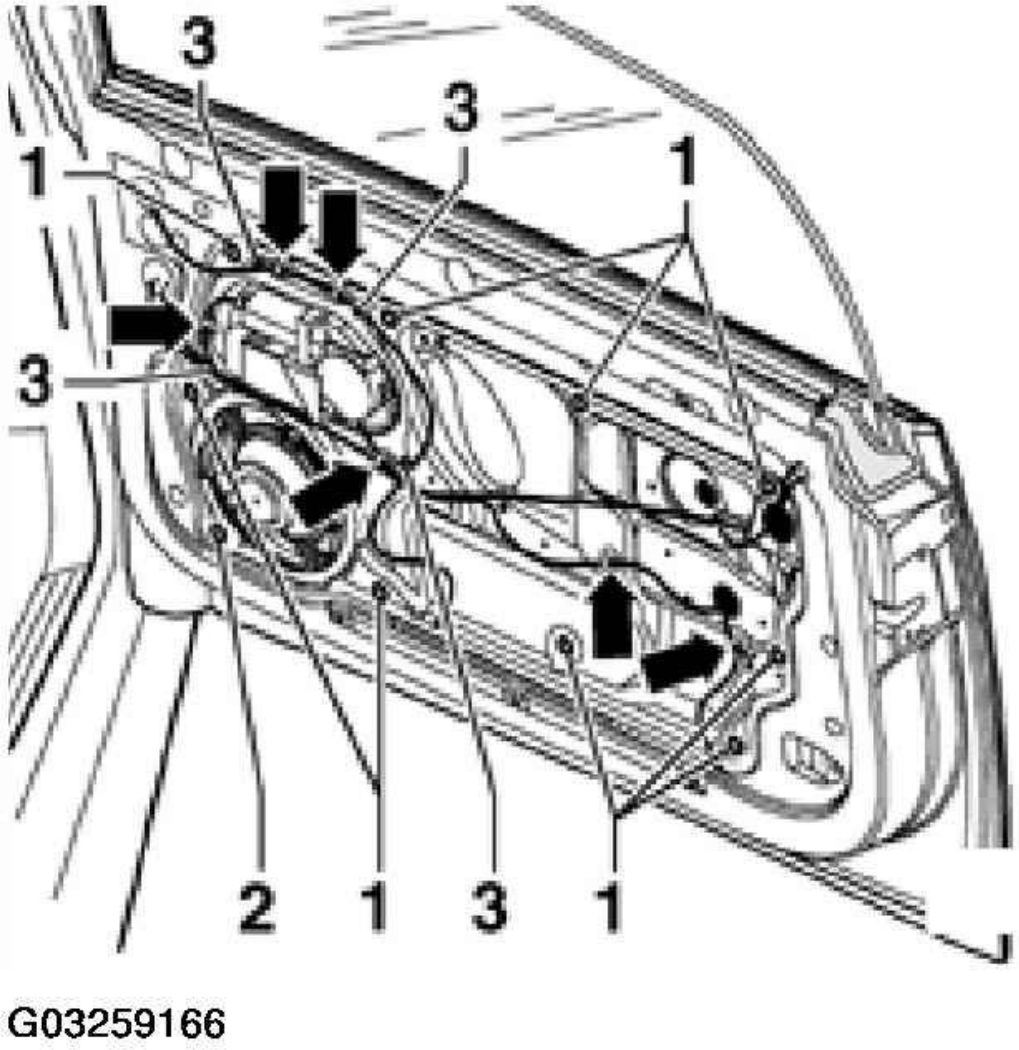


Fig. 19: Pulling Off Intake Hose And Connector From Mass Air Flow Sensor
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Remove connector from ABS Control Module (arrow -1-) and pull off (arrow -2-).

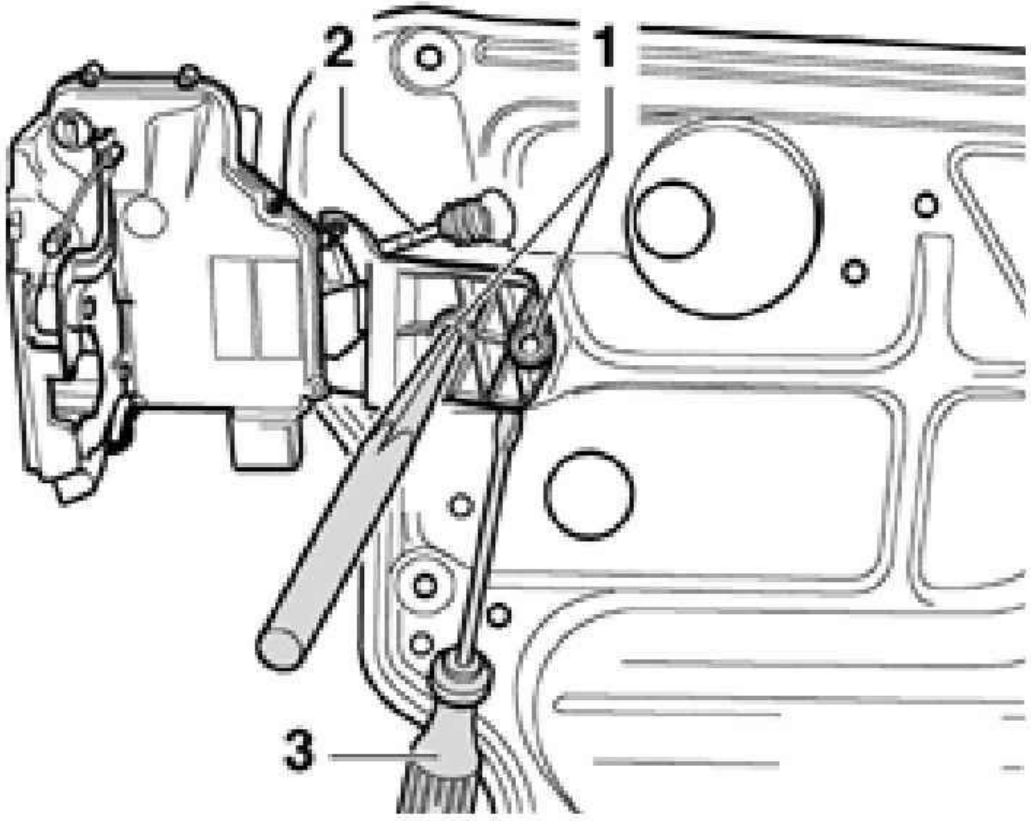


Fig. 20: Removing Connector From ABS Control Module
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Using a screwdriver, lift cover of multi-pin connector and remove.

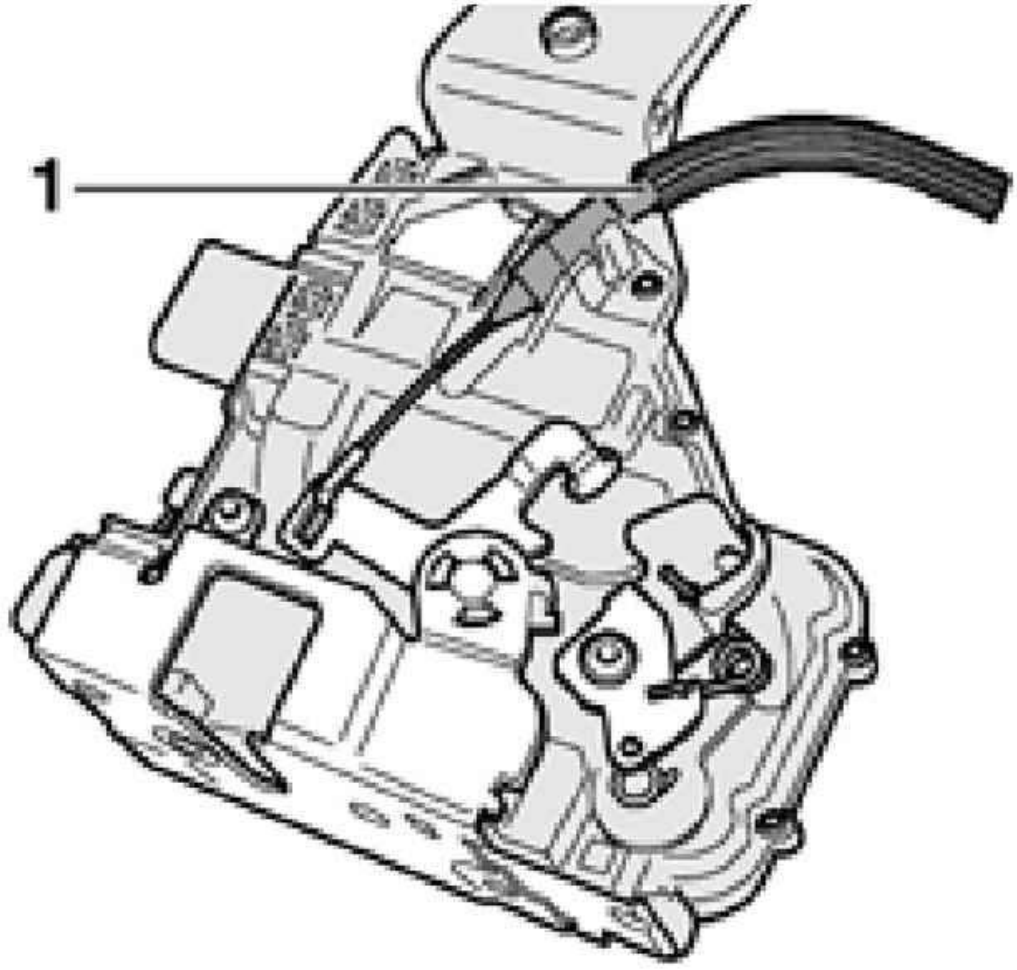


Fig. 21: Lifting Cover Of Multi-Pin Connector Using A Screwdriver
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Using a small screw driver, push purple latch in direction of arrow.

Pin assignment of harness connector T25 and ABS Control Module (w/EDL) -J104-

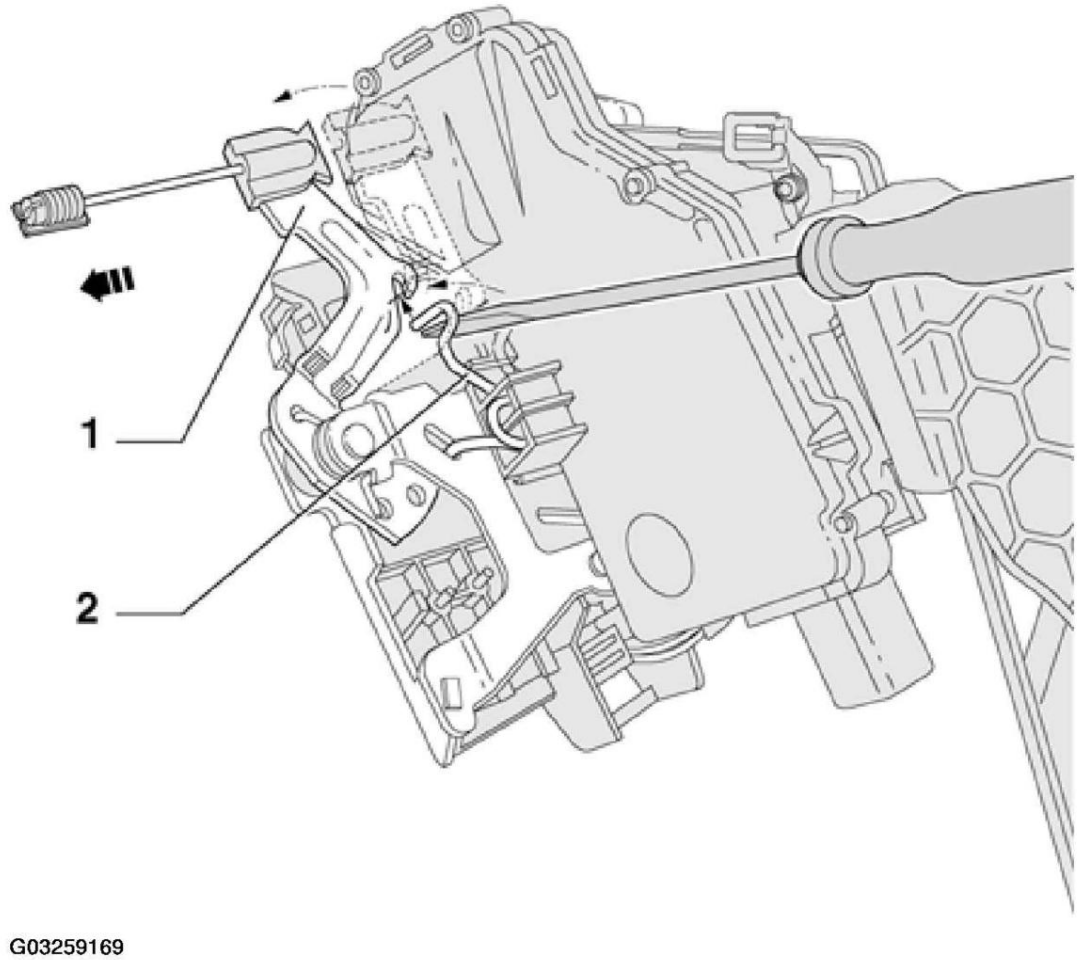


Fig. 22: Pushing Purple Latch Using A Small Screw Driver
Courtesy of VOLKSWAGEN OF AMERICA, INC.

HARNESS CONNECTOR T25 PIN REFERENCE - FRONT WHEEL SPEED SENSORS

Pin	Connected to component:
19 + 20	Right Front ABS Wheel Speed Sensor -G45-
1 +2	Left Front ABS Wheel Speed Sensor -G47-

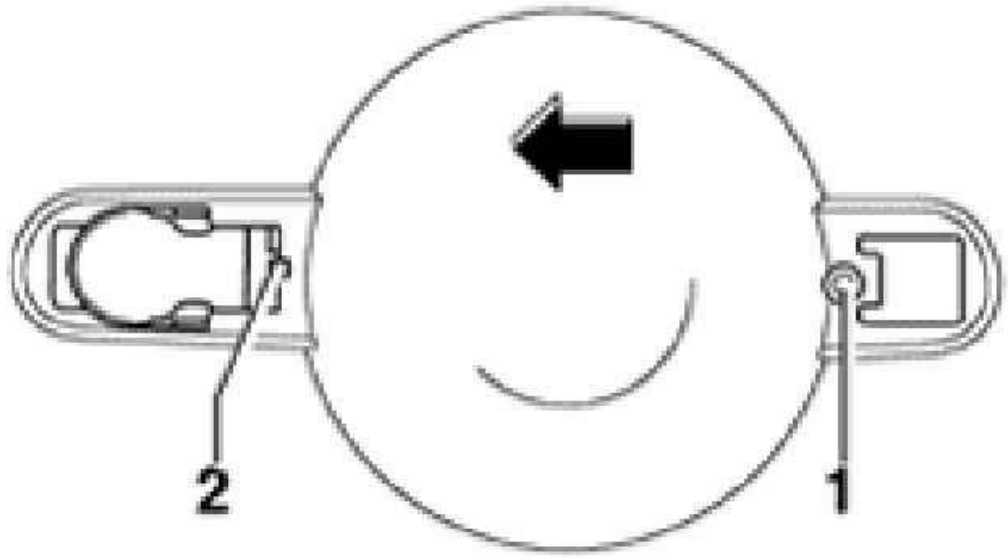


Fig. 23: Identifying Harness Connector T25 Terminal
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Using extractor tool from harness repair kit VAS 1978, push out applicable terminals.

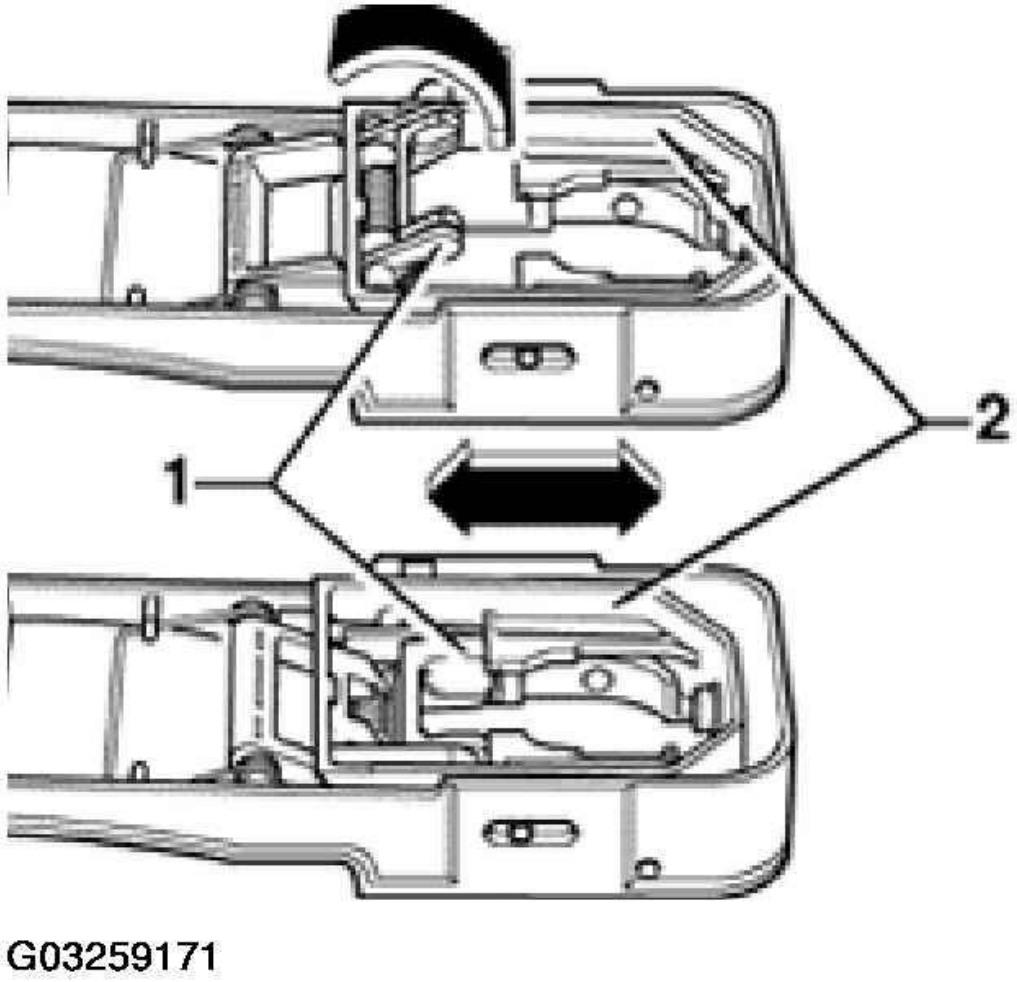
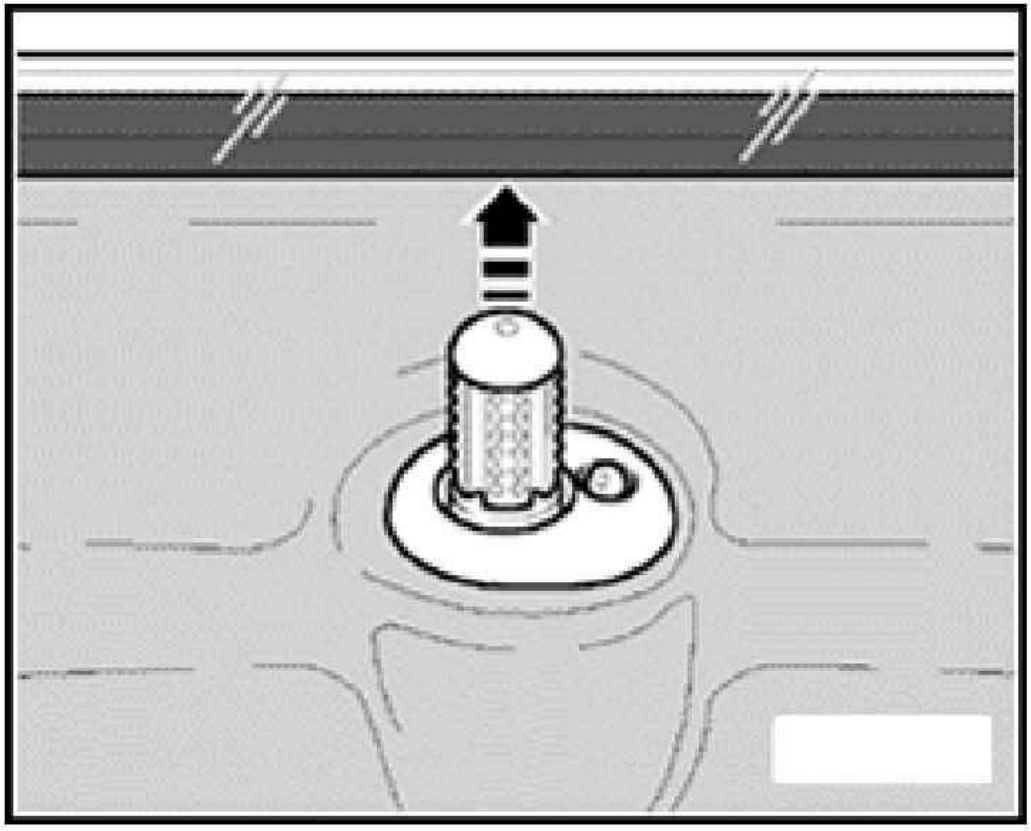


Fig. 24: Pushing Out Applicable Terminals Using Extractor Tool
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Disconnect wheel speed sensor and speed sensor wiring connector, see **REMOVING AND INSTALLING SPEED SENSOR ON FRONT AXLE** .
- Replace faulty wheel speed sensor wiring.
- Connect speed sensor to speed sensor wiring.
- Secure wheel speed sensor wiring (arrows).

NOTE: Make sure the wiring is not twisted in the wheel well.



G03259172

Fig. 25: Identifying Wheel Speed Sensor Wiring
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Install pin connectors in connector housing.
- Using installation tool from VAS 1978, push individual wire seals to stop.

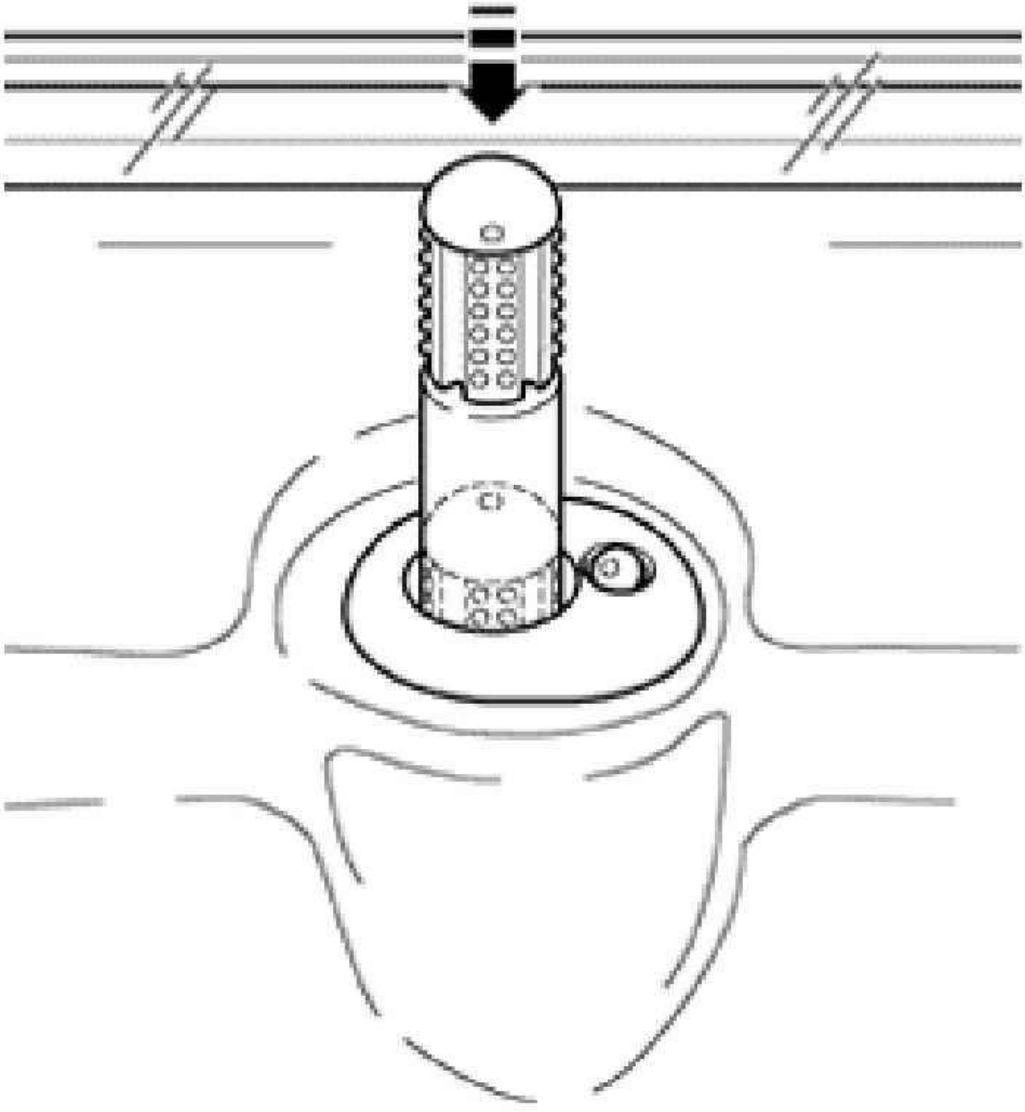


Fig. 26: Pushing Individual Wire Seals To Stop Using Installation Tool
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Secure terminals by engaging purple latch and install connector cover of multi-pin connector.

ABS SYSTEM COMPONENTS ON REAR AXLE, REMOVING AND INSTALLING

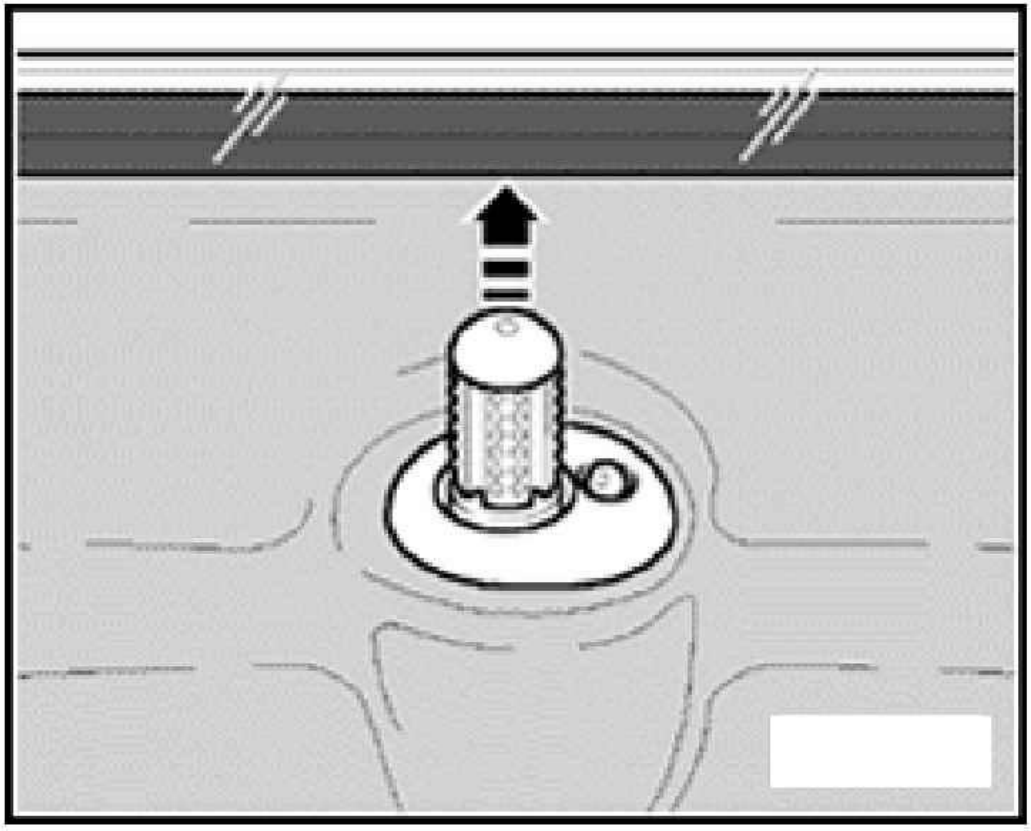
CAUTION: Before working on the brake system, read CAUTIONS and WARNINGS on SAFETY PRECAUTIONS .

NOTE: The following list refers to items in Fig. 27 .

1. **ABS wheel speed sensor**
   - Before installing sensor, clean hole inner surface and coat with grease, Part No. G 000 650
2. **Socket-head bolt**
   - 8 N.m (71 in lb)
3. **Stub axle**
4. **Splash shield**
5. **Wheel hub with wheel bearing and rotor**
   - Replace only as complete unit.
   - Removing and installing

     See **WHEEL BEARING** .
6. **Self-locking 12-point nut**
   - 175 N.m (129 ft. lb)
   - Always replace after removing
7. **Cap**
   - Pressing off and driving in

     See **WHEEL BEARING** .
8. **Brake disc**
9. **Phillips screw**
10. **Bolt**
    - 60 N.m (44 ft. lb)
    - With dished spring washer
11. **Brake drum**
    - Brake drum diameter: 230 mm (9.055 in.)
    - Wear limit: 231 mm (9.094 in.)
    - Clean thoroughly, check for wear, damage, tolerances, damaged wheel bolt threads and braking surface wear.
12. **Backing plate with brake shoes**
    - Not applicable
13. **Axle beam**



G03259174

Fig. 27: Identifying ABS System Components On Rear Axle
Courtesy of VOLKSWAGEN OF AMERICA, INC.

WHEEL SPEED SENSOR ON REAR AXLE (DISC BRAKES), REMOVING AND INSTALLING

Removing

- Raise vehicle.
- Separate wheel speed sensor and speed sensor wiring connector -1-.
- Remove bolt -2- from stub axle.
- Pull ABS wheel speed sensor out of stub axle.

Installing

- Before inserting wheel speed sensor, clean hole inner surface and coat speed sensor with grease, Part No. G 000 650.

- Insert wheel speed sensor into hole in stub axle and tighten bolt to 8 N.m (71 in. lb).
- Connect wheel speed sensor to speed sensor wiring.

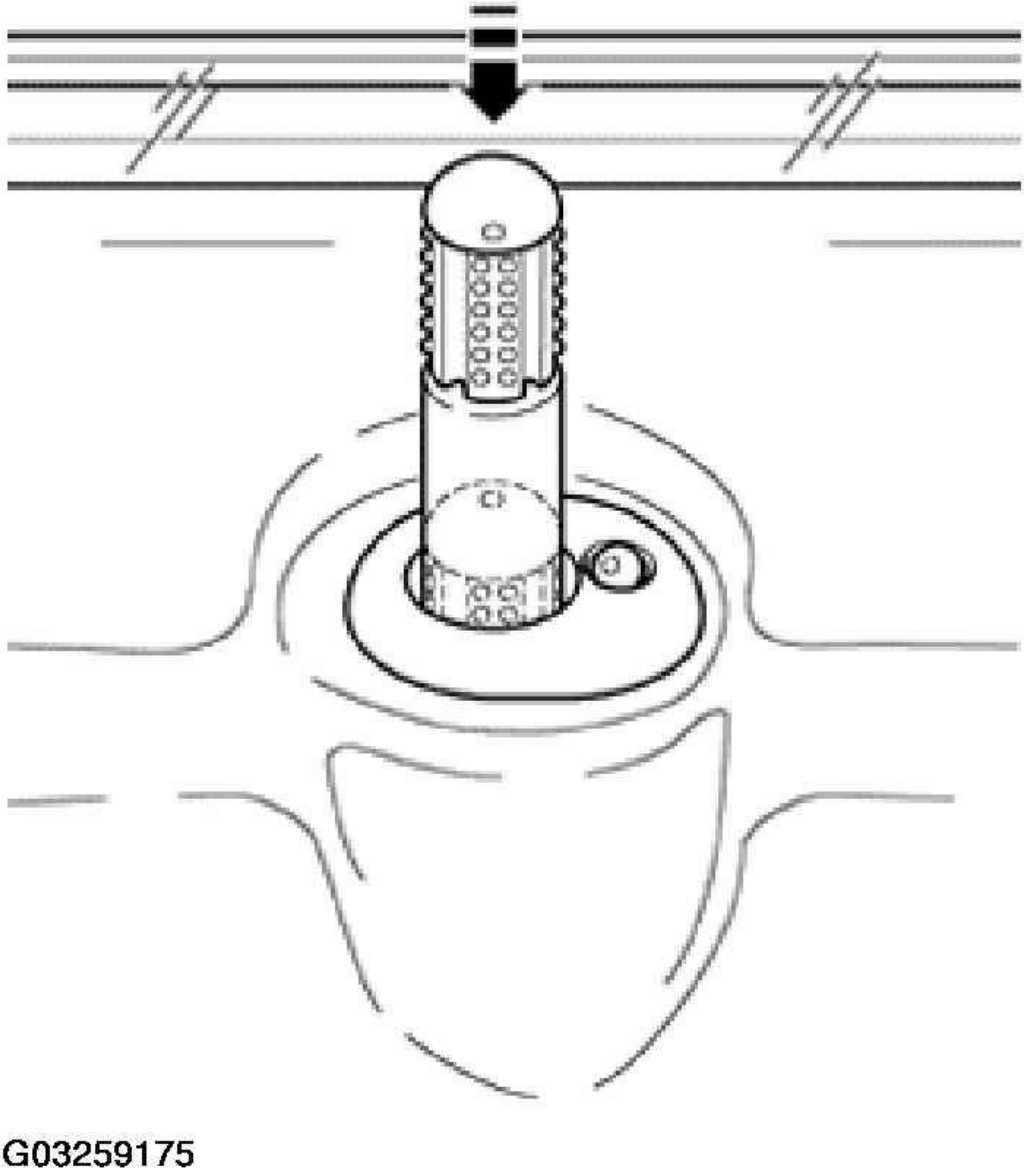


Fig. 28: Separating Wheel Speed Sensor And Speed Sensor Wiring Connector
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Wheel speed sensor rotor on rear axle (disc and drum brakes), checking

- Raise vehicle.
- Remove wheel.
- Vehicles with drum brakes, remove brake drum.
- Remove wheel speed sensor from wheel bearing housing.
- Check rotor for damage or dirt.
- If rotor is damaged, remove wheel hub with rotor and replace.

See **WHEEL BEARING** .

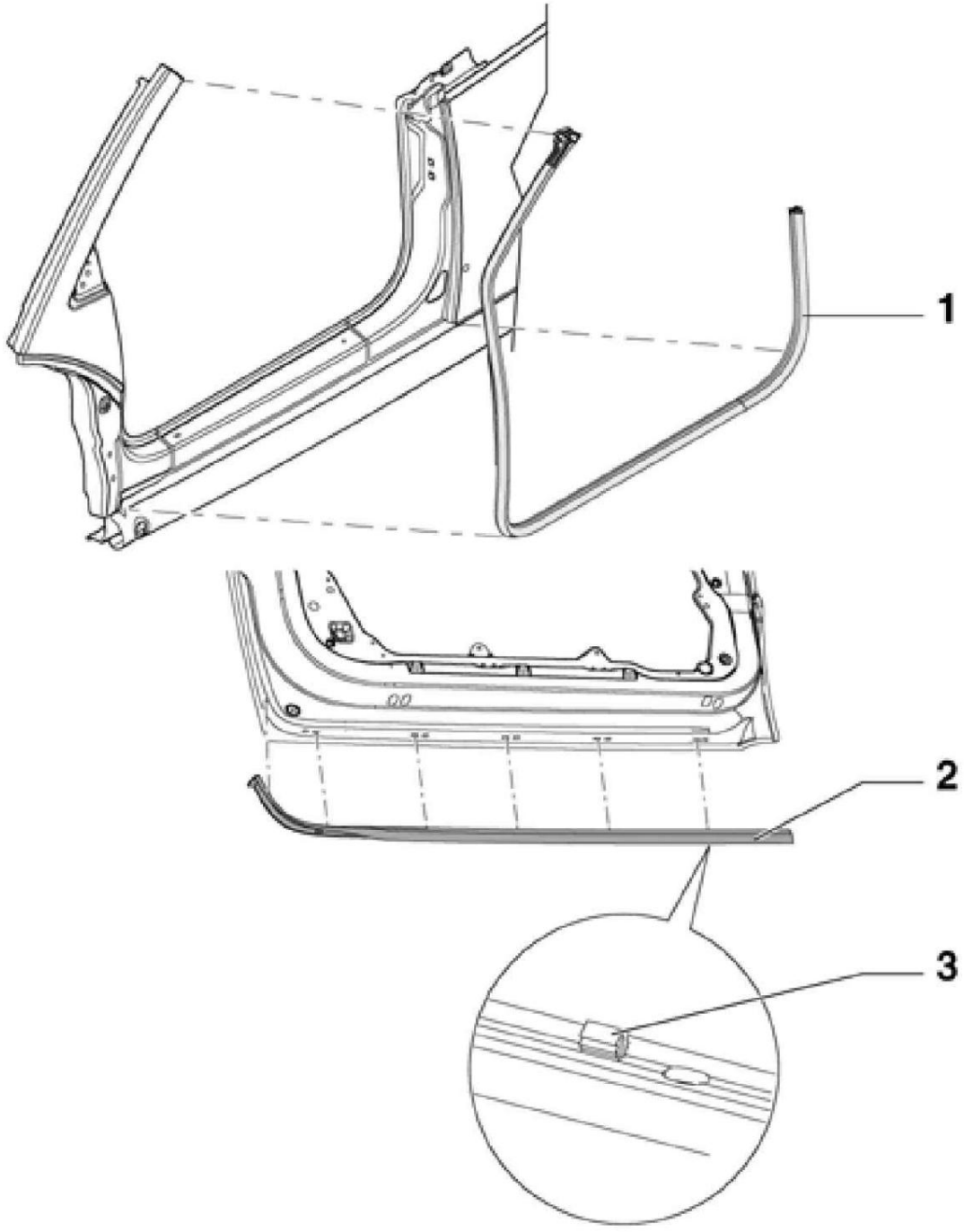
WHEEL SPEED SENSOR ON REAR AXLE (DRUM BRAKES), REMOVING AND INSTALLING

Removing

- Raise vehicle.
- Disconnect wheel speed sensor and speed sensor wiring connector -1-.
- Remove bolt -2- from stub axle.
- Pull ABS wheel speed sensor out of stub axle.

Installing

- Before inserting speed sensor, clean hole inner surface and coat speed sensor with grease, Part No. G 000 650.
- Insert speed sensor into hole in stub axle and tighten bolt to 8 N.m (71 in. lb).
- Connect speed sensor to speed sensor wiring.



1 - Door inner seal

2 - Dust seal

3 - Clip

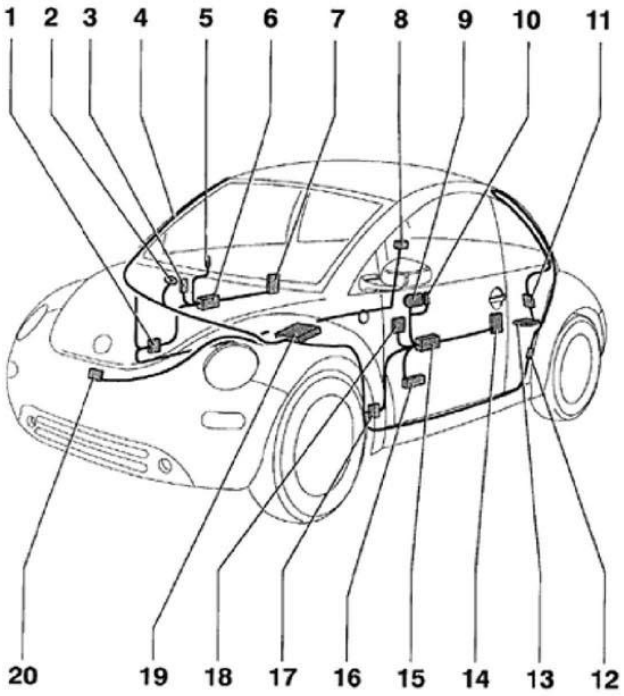
G03259176

Fig. 29: Disconnecting Wheel Speed Sensor And Speed Sensor Wiring Connector
Courtesy of VOLKSWAGEN OF AMERICA, INC.

ABS WHEEL SPEED SENSOR WIRING TO REAR AXLE, REMOVING AND INSTALLING

Special tools and equipment

- VAS 1978 wiring harness repair kit



1 - Coupling station
2 - Anti-theft alarm horn
3 - Front right power window switch
4 - Aerial for remote control
5 - Interior locking switch, front passenger's side
6 - Front right door control unit
7 - Front right door lock
8 - Motor for fuel tank lid unlock V155
9 - Exterior mirror adjustment switch and change-over switch
10 - Interior locking switch, driver's side
11 - Tailgate/trunk lid remote release motor
12 - Coupling station
13 - Hood lock
14 - Front left door lock
15 - Front left door control unit
16 - Controls
17 - Coupling station
18 - Power window switch
19 - Central control unit
20 - Hood lock

G03259177

Fig. 30: Identifying VAS 1978 Wiring Harness Repair Kit
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Removing

- Obtain radio code on vehicles with coded radio.
- Disconnect battery.
- Disconnect wheel speed sensor and speed sensor wiring connector.
- Remove rear interior side panel.

  See **SIDE PANEL TRIM, REMOVING AND INSTALLING**

- Strip insulation (arrow) from shrink connection.

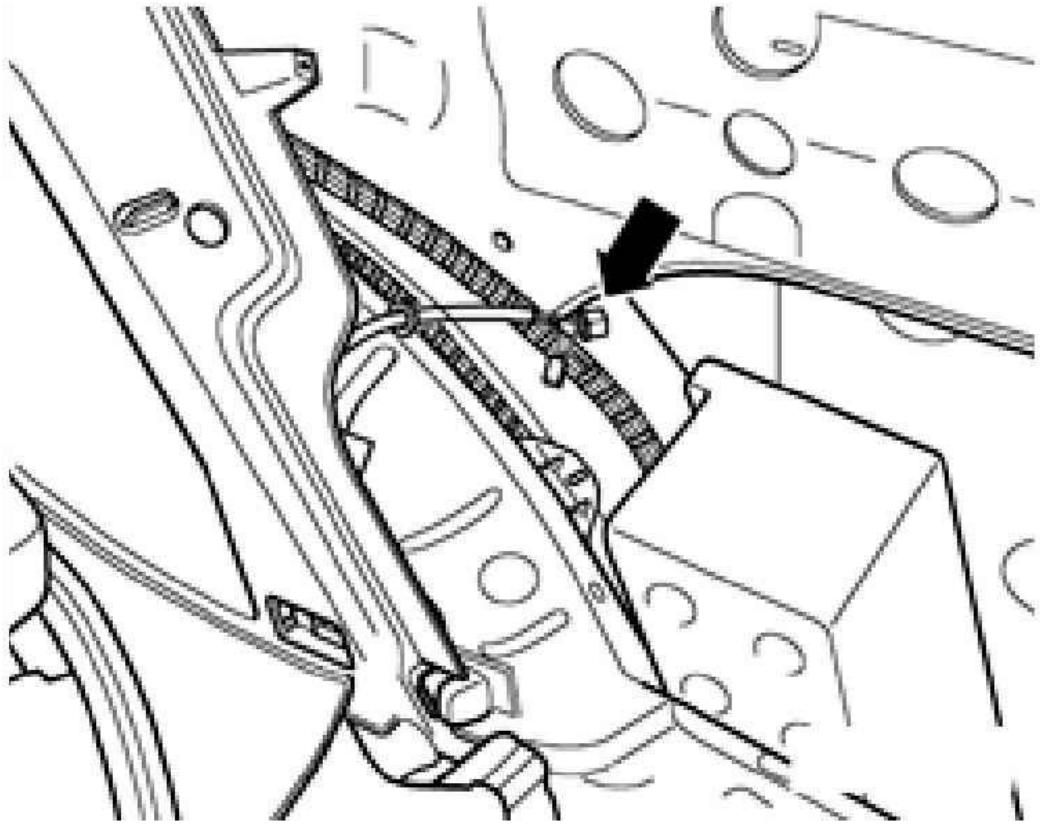


Fig. 31: Identifying Strip Insulation From Shrink Connection
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Cut wheel speed sensor wire in front of spliced connection with stripping pliers from wiring repair kit VAS 1978 and remove faulty wiring.

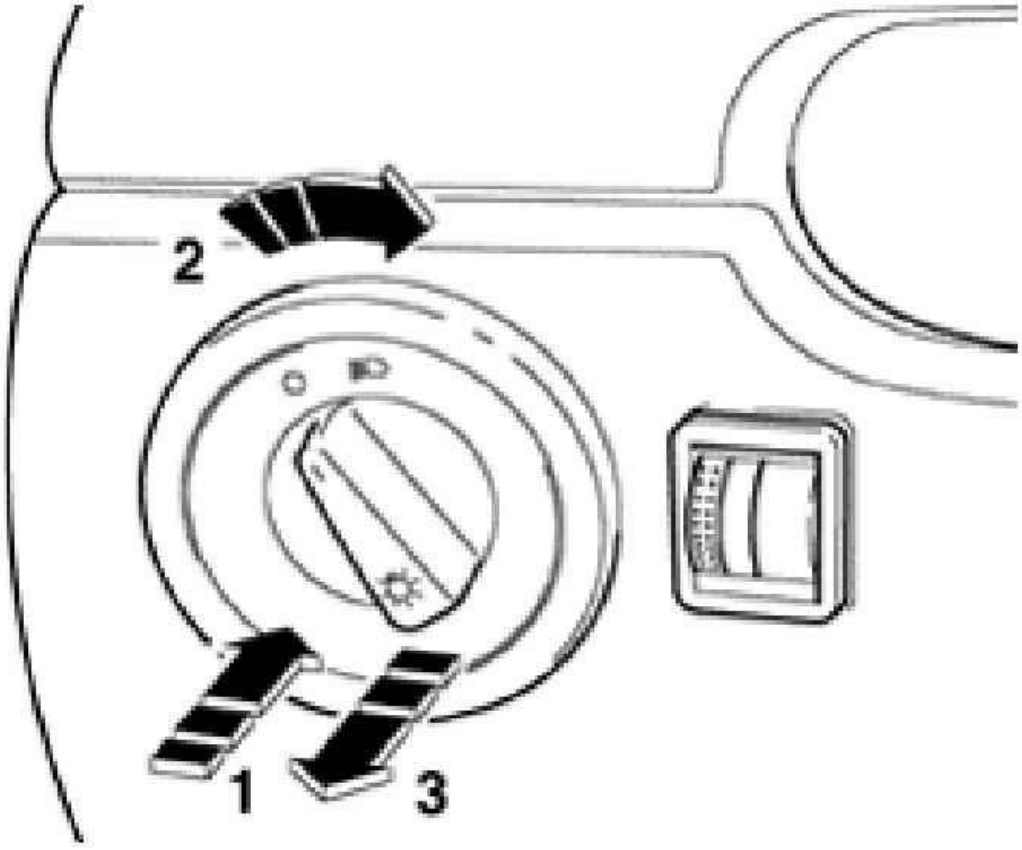


Fig. 32: Cutting Wheel Speed Sensor Wire In Front Of Spliced Connection With Stripping Pliers
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Strip insulation at wiring end by 15 mm (5/8 in.) using stripping pliers from repair kit and fold over stripped wire portion.
- Install new wheel speed wiring
- Connect wheel speed sensor to speed sensor wiring.

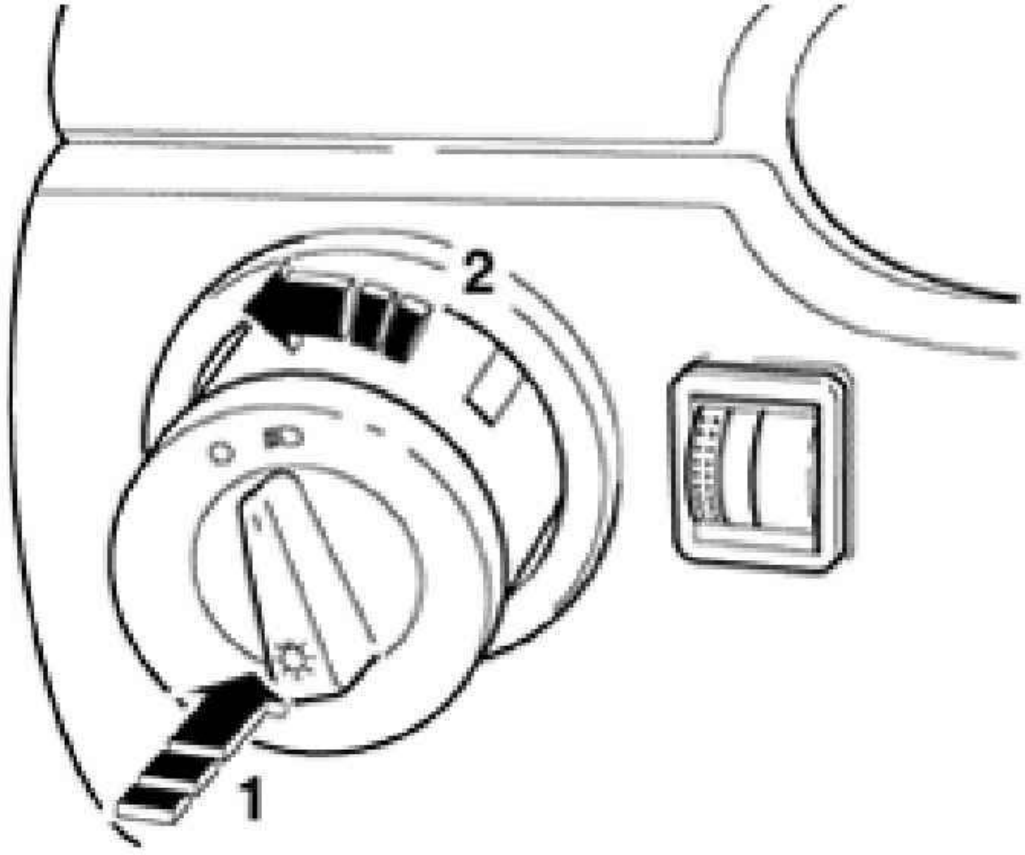


Fig. 33: Striping Insulation At Wiring End By 15 Mm Using Stripping Pliers
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Secure wheel speed sensor wire (arrows).

CAUTION: Do not twist wires in the wheel well.

- Connect wiring to wheel speed sensor.
- Cut 2-pin connector at new wheel speed sensor wire (if installed) using the stripping pliers from the repair kit.
- Strip 15 mm (5/8 in.) insulation off wire end and fold over stripped wire.
- Connect wheel speed sensor wire using correct size connector from wiring repair kit VAS 1978.

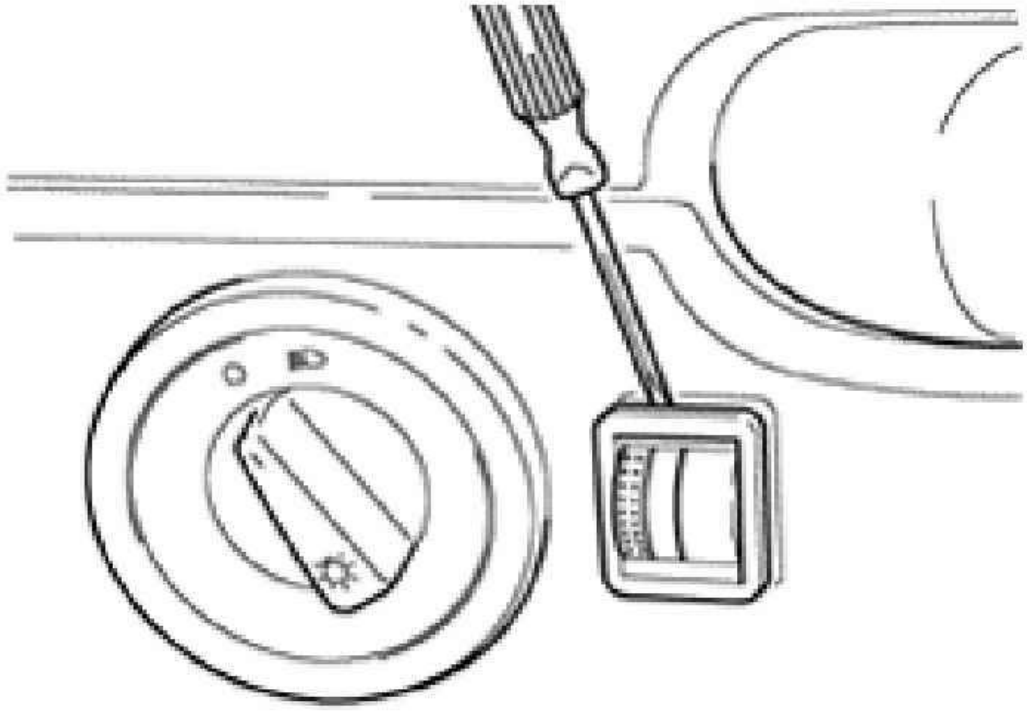


Fig. 34: Identifying Wheel Speed Sensor Wire
Courtesy of VOLKSWAGEN OF AMERICA, INC.

ANTI-LOCK BRAKE SYSTEM (ABS) MARK 60

The following versions of the ABS Mark 60 are installed in this vehicle:

- ABS/EDL/ASR with Electronic Stabilization Program (ABS/EDL/ASR/ESP)

GENERAL INFORMATION ON THIS ABS, ABS/EDL

Application of ABS in a left-hand drive vehicle.

NOTE: The following list refers to items in Fig. 35 .

1. Brake booster
2. Hydraulic unit
3. Control module, 47-pin (screwed to hydraulic unit). Two 4.8 mm wide contacts are located at both ends

of the connection.

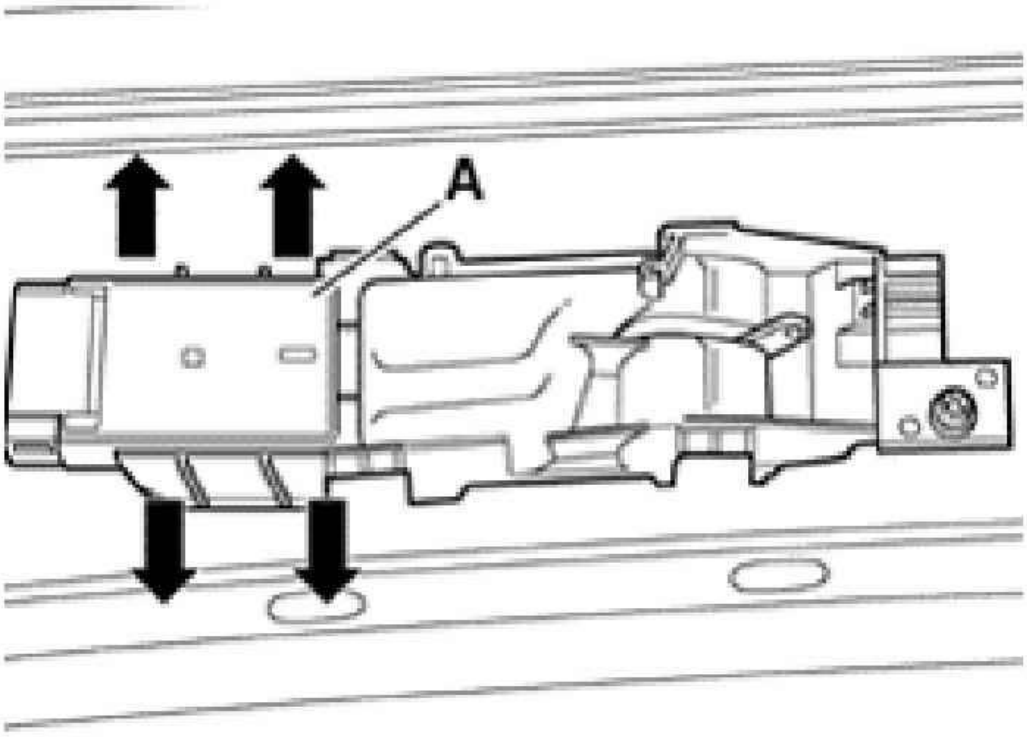


Fig. 35: Identifying ABS In A Left-Hand Drive Vehicle - Mark 60 ABS
Courtesy of VOLKSWAGEN OF AMERICA, INC.

For vehicles from m.y.12.01 the mechanical brake assist is installed. It's integrated in the brake booster for the use within the system as special equipment. This can be recognized by the replacement part number.

Repairing the mechanical brake assist is not possible. The brake booster must be replaced complete.

The ABS brake system is divided diagonally. The brake booster is a pneumatic type and the vacuum is provided by brake booster.

Vehicles with Mark 60 ABS do not have a mechanical brake pressure regulator. A specially matched software in the control module controls the rear axle brake pressure regulator.

Malfunctions in the ABS systems do not influence the brake system and booster. The conventional braking system remains functional even without ABS.

The hydraulic unit -a- and control module -b- (47 pin) form one component. Separating is only possible when removed.

New control modules service via the replacement parts are not coded and require coding after installation.

See **ABS CONTROL MODULE, CODING** .

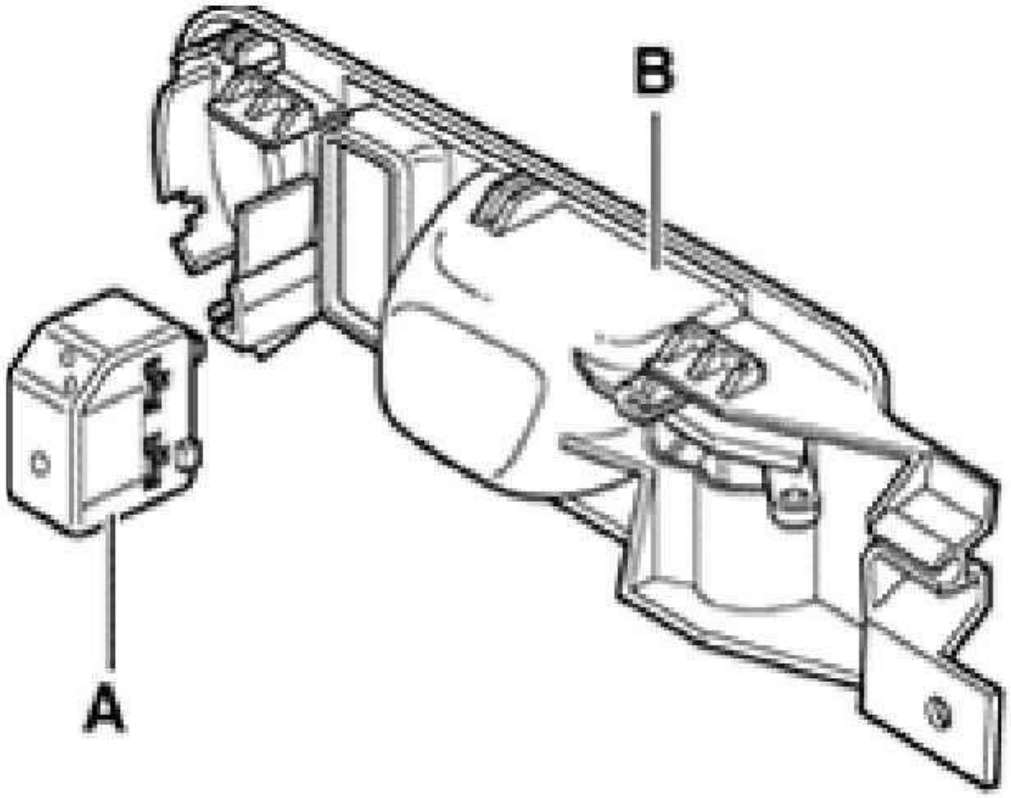


Fig. 36: Identifying Hydraulic Unit And Control Module - Mark 60 ABS
Courtesy of VOLKSWAGEN OF AMERICA, INC.

DISTINGUISHING FEATURES OF ABS MARK 60

ABS/EDL/ASR/ESP Mark 60

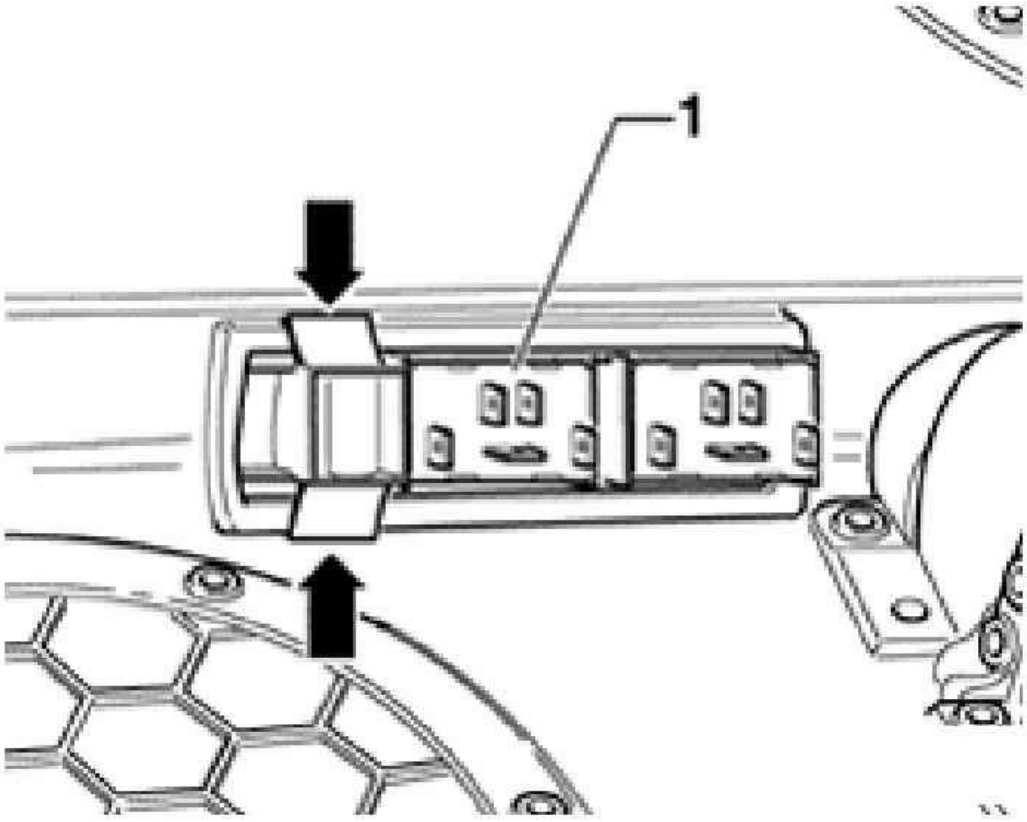


Fig. 37: Identifying ABS/EDL/ASR/ESP Mark 60 Dimensions
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Dimension a = 100 mm

1. Control module, 47-pin (screwed to hydraulic unit). Two 4.8 mm wide contacts are located at both ends of the connection.

NOTES FOR REPAIR WORK ON ABS, ABS/EDL

- Before working on the anti-locking system, determine the cause of the malfunction On Board Diagnostic (OBD).

  See **ON BOARD DIAGNOSTIC (OBD), PERFORMING**

- Before working on the ABS, ABS/EDL system, disconnect the battery Ground strap. Obtain coding, on

vehicles with coded radio.

- Before carrying out welding work with an electric welding unit, disconnect the ABS control module.
- When working with brake fluid, observe the relevant safety precautions and notes.
- Work for which the brake system has to be opened, bleed the brake system with brake filler and bleeder unit VAS 5234.
- During the final road test, make sure that a controlled brake test is performed at least once (pulsations must be felt at the brake pedal).
- Absolute cleanliness is required when working on the anti-locking brake system, it is not permitted to use any products which contain mineral oil, such as oils, greases etc.
- Thoroughly clean all unions and the adjacent areas before loosening, do not use aggressive cleaning agents such as brake cleaner, gas, thinners or similar.
- Place removed parts on a clean surface and cover.
- After separating the control module/hydraulic unit use the transportation protection for the valve dome.
- Carefully cover or seal open components if repairs cannot be carried out immediately. (Use sealing plugs repair kit 1 H0 693 311 A).
- Do not use fluffy cloths.
- Only remove replacement parts from packaging immediately prior to installation.
- Only use genuine packed parts.
- When the system is open do not work with compressed air and do not move the vehicle.
- Make sure no brake fluid enters plug connectors.

HYDRAULIC UNIT, BRAKE BOOSTER/BRAKE MASTER CYLINDER - ASSEMBLY OVERVIEW MARK 60

NOTE: Complete master cylinder and brake booster can be replaced independently of each other.

NOTE: The following list refers to items in Fig. 38 .

1. **Brake booster, left-hand drive**
   - On gasoline engines the vacuum required is taken from the intake manifold.
   - On Diesel engines a vacuum pump is installed to create the required vacuum.
   - On some vehicles an electrical brake system vacuum pump -V192- is installed
   - Functional check
     - With engine not running, depress brake pedal firmly several times (to exhaust the vacuum in the module).
     - Now depress brake pedal with average foot pressure, hold and start engine. If the booster module is working properly, the pedal will be felt to give slightly under foot (booster assistance becomes effective).
   - If faulty, replace complete

- Non-return valve (in vacuum hose).

  Functional check. See **VACUUM CHECK VALVE** .

- Separating from brake pedal. See **BRAKE BOOSTER** .
- Removing and installing. See **BRAKE BOOSTER** .

2. **Sealing cap**
3. **Brake fluid reservoir, left-hand drive (LHD)**
4. **Sealing plugs**
   - Moisten with brake fluid and install into brake fluid reservoir
5. **Retaining pin**
   - Insert through brake master cylinder
6. **Brake master cylinder, left-hand drive (LHD)**
   - Must not be repaired. If faulty, replace complete.
7. **Brake line**
   - Brake master cylinder (primary circuit) to hydraulic unit
8. **Connection for brake line**
   - Hydraulic unit to left front brake caliper
9. **Connection for brake line**
   - Hydraulic unit to right front brake caliper
10. **Brake line**
    - Brake master cylinder (secondary circuit) to hydraulic unit
11. **Control module**
    - Do not disconnect connector before performing On Board Diagnosis (OBD)
12. **Hydraulic unit ABS/EDL**
13. **Bracket**
14. **Hex nut, 20 N.m (15 ft. lb)**
15. **Bolts, 8 N.m (70 in lb)**
16. **Torx socket head bolt E5, 4 N.m (35 in lb)**
17. **Connection for brake line**
    - Hydraulic unit to left rear wheel cylinder/brake caliper
18. **Connection for brake line**
    - Hydraulic unit to right rear wheel cylinder/brake caliper
19. **Brake fluid reservoir, right-hand drive (RHD)**
20. **Sealing plugs**
    - Moisten with brake fluid and install into brake fluid reservoir
21. **Bleed valve**
22. **Retaining plate**

- Used to secure the wiring harness

23. **Self-locking hex nut, 20 N.m (15 ft. lb)**
24. **Brake master cylinder, right-hand drive (RHD)**
    - Must not be repaired. If faulty, replace complete.
25. **Sender 1 for brake booster -G201-**
26. **Bolt**
    - To secure brake fluid reservoir to brake master cylinder
27. **Seal**
    - Always replace
28. **Brake booster, right-hand drive**
29. **Seal**
    - For brake booster
30. **Self-locking hex nut, 20 N.m (15 ft. lb)**
31. **Boots**
    - Make sure boots seats correctly otherwise there is a danger of suction noises
32. **Retainer**
    - Secured to edge of brake booster
33. **Heat shield**
    - Application
    - See Parts catalog
34. **Retainer**
    - Used to secure the wiring harness
35. **Sealing plug**

Fig. 38: Identifying Hydraulic Unit, Brake Booster/Brake Master Cylinder Assembly - Mark 60 ABS
Courtesy of VOLKSWAGEN OF AMERICA, INC.

CONTROL MODULE AND HYDRAULIC UNIT, REMOVING AND INSTALLING

Special tools and equipment

- VAG 1331 Torque wrench or equivalent
- VAG 1410 Torque wrench or equivalent
- VAG 1869/2 Brake pedal depressor or equivalent

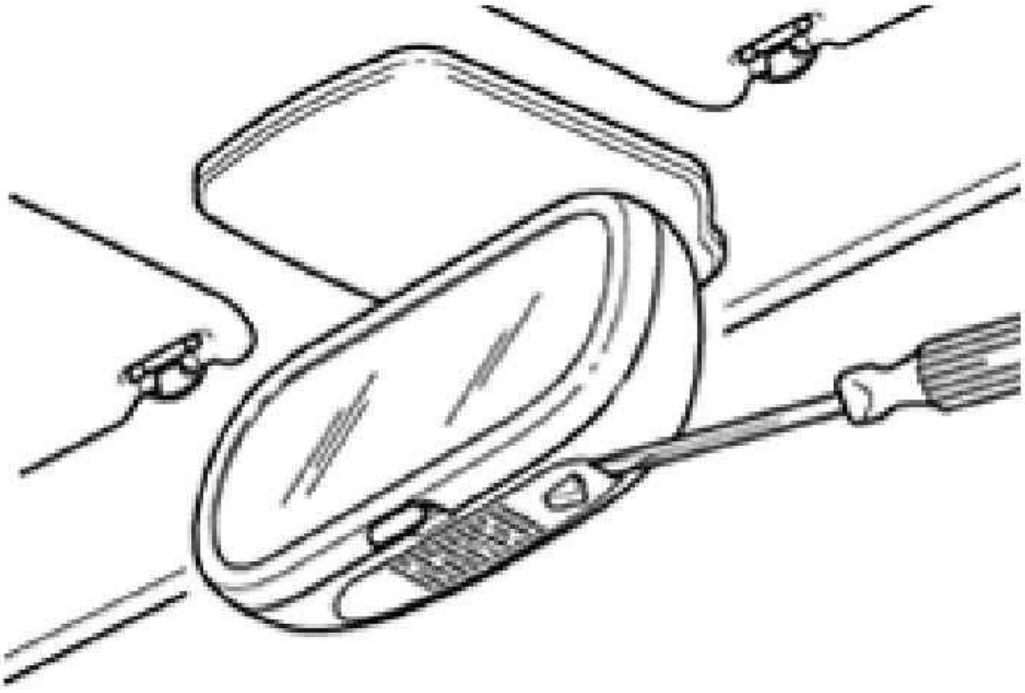


Fig. 39: Identifying Special Tools And Equipment
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Location:

The control module is screwed to the hydraulic unit and is located on left in the engine compartment.

WARNING: Do not bend the brake lines in the area of the hydraulic unit!

Removing

- Obtain radio code on vehicles with coded radio.
- Disconnect battery.
- Remove intake hose -1- and connector -2- off mass air flow sensor.
- Remove bolts -3-, -4- and -5-.
- Take out air cleaner complete.

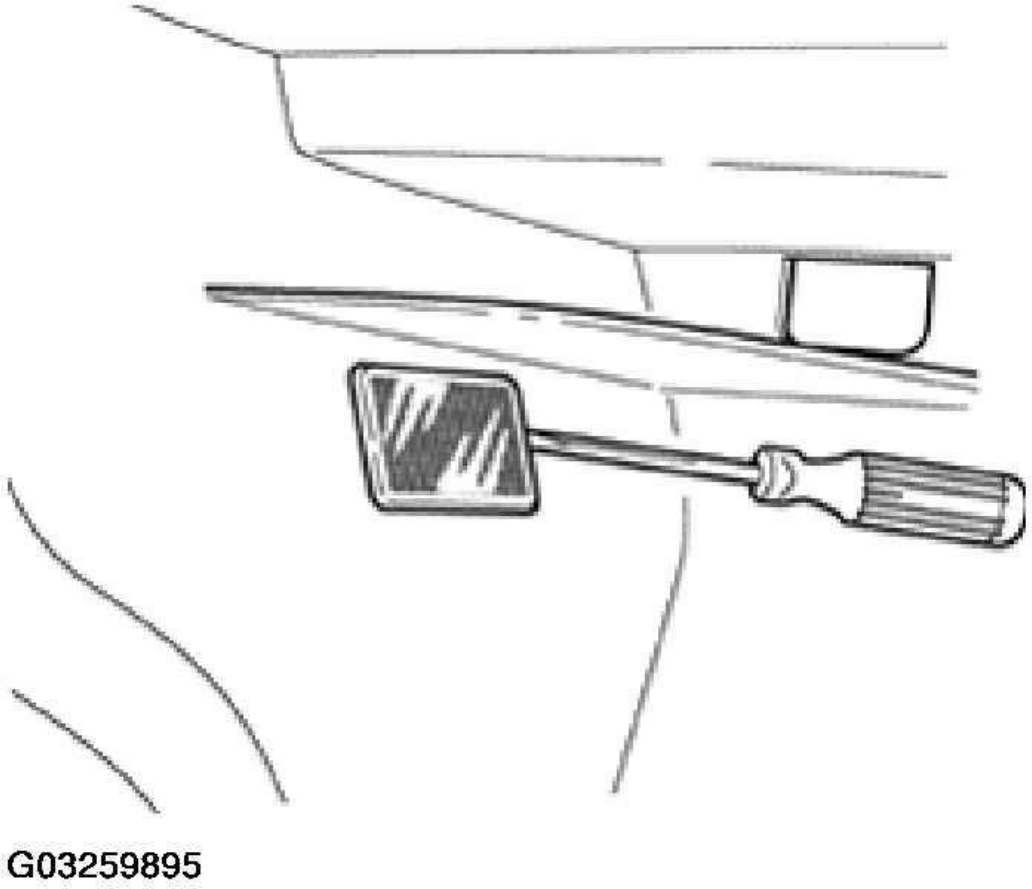


Fig. 40: Removing Intake Hose And Connector Off Mass Air Flow Sensor
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- If installed, remove relay protective housing -1- from cable channel.
- Draw off as much brake fluid as possible from brake fluid reservoir using a suction bottle.

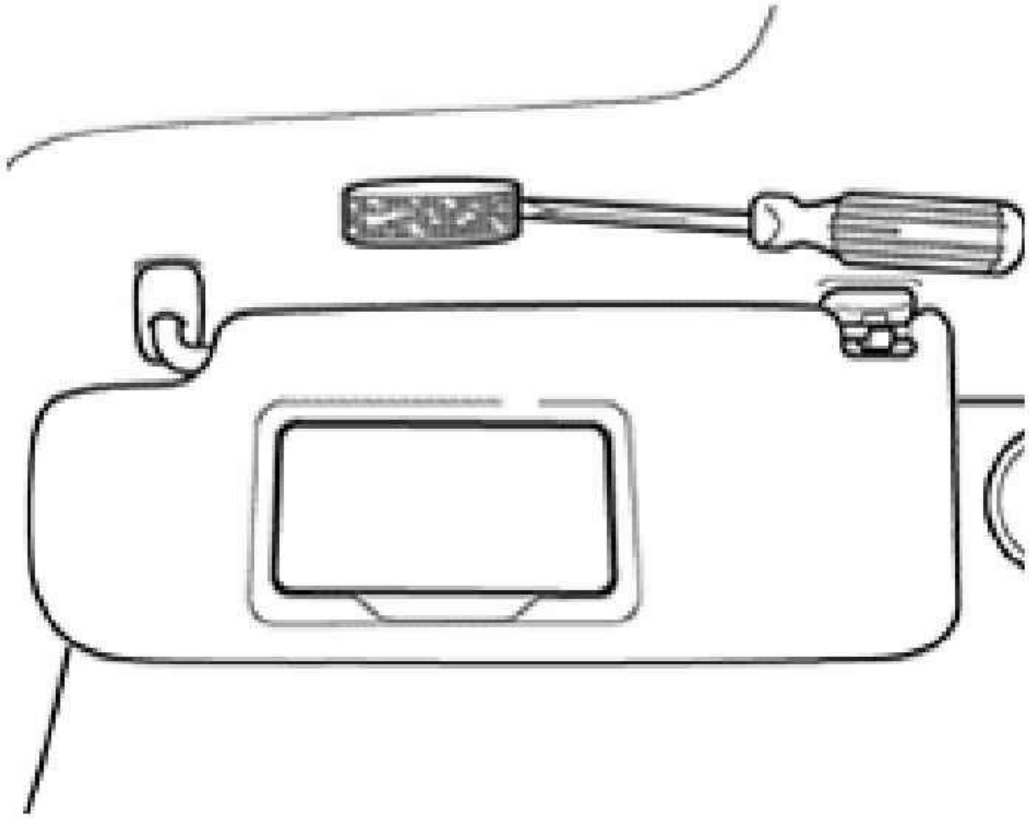


Fig. 41: Removing Relay Protective Housing From Cable Channel
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Release connection from control module (arrow -1-) and pull off (arrow -2-).
- Install brake pedal depressor VAG 1869/2.
- Connect a bleeder bottle hose to left front and right rear brake caliper bleed screws and open bleed screws.
- Depress brake pedal at least 60 mm (2.362 in.) using brake pedal depressor.
- Close left front and right rear bleed screws
- Do not remove brake pedal depressor VAG 1869/2.
- Place sufficient lint-free cloths under control module and the hydraulic unit.

Make sure no brake fluid reaches the contacts.

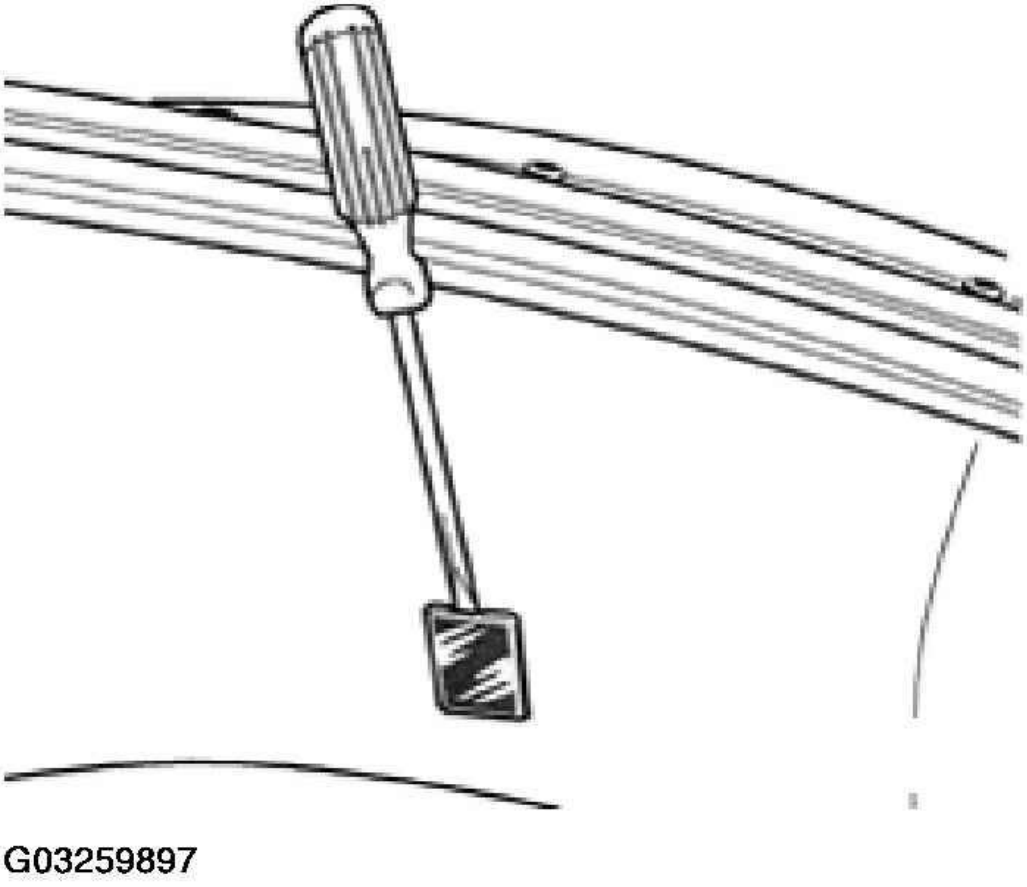


Fig. 42: Releasing Connection From Control Module
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Disconnect brake line from hydraulic unit -1- to brake master cylinder and tie-up.

Fig. 43: Disconnecting Brake Line From Hydraulic Unit To Brake Master Cylinder And Tie-Up
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Disconnect the remaining brake lines from the hydraulic unit.
- Seal brake lines and threaded holes with sealing plugs from repair kit Part No. 1H0 698 311 A.
- Remove bolts -arrows- from bracket for control module/hydraulic unit.
- Take out hydraulic unit with control module.

Removing control module from hydraulic unit

- Place hydraulic unit with control module downward on a clean flat surface.
- Remove torx socket head screws E5 -arrows- from control module and pull off control module.

WARNING: The hydraulic pump must not be separated from the hydraulic unit.

- Carefully lift the hydraulic unit along with the hydraulic pump, at the joint -1-, upward off the control module.

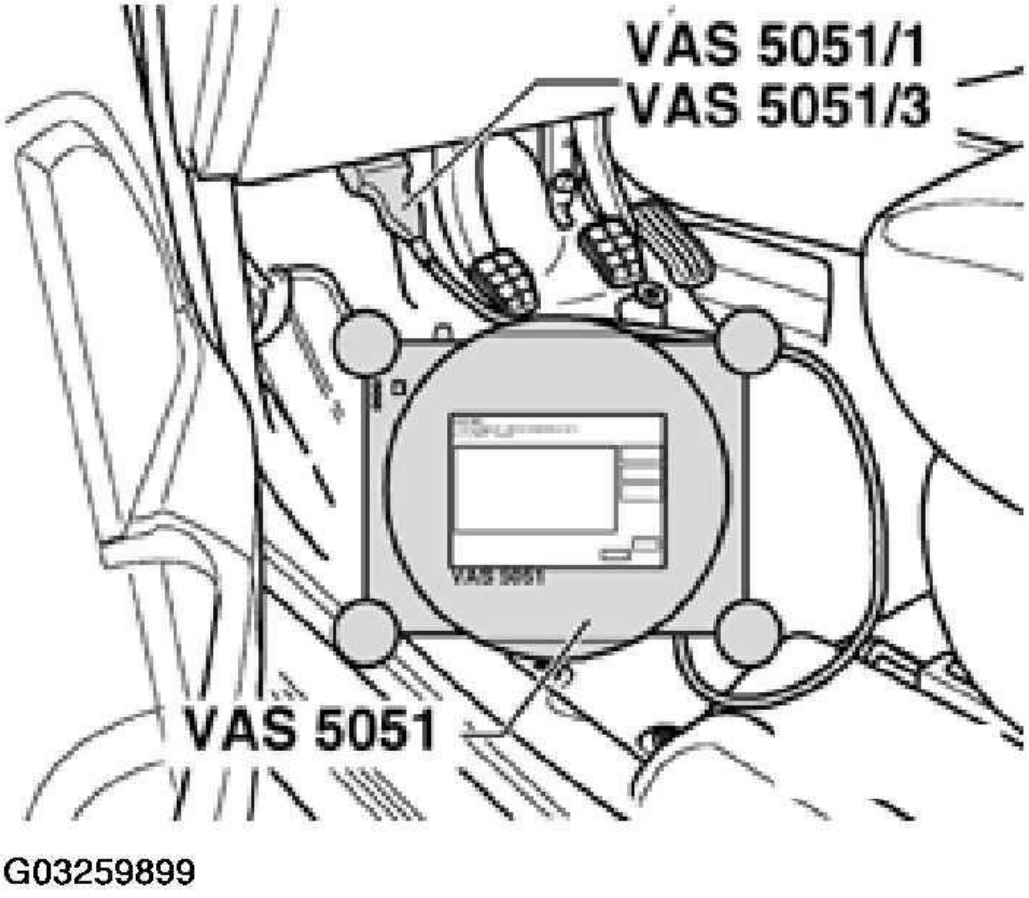


Fig. 44: Carefully Lift The Hydraulic Unit Along With The Hydraulic Pump Off The Control Module
Courtesy of VOLKSWAGEN OF AMERICA, INC.

When pulling off of the control module, make sure that the hydraulic unit electrical contact pin is not tilted against the control module solenoid valves.

Cover control module magnetic coils with a lint-free cloth.

After separating control module and hydraulic unit use transportation protection device for contact pin.

The electrical contact pin supplied as a spare part for the control module can only be clipped in once and thereafter never removed again.

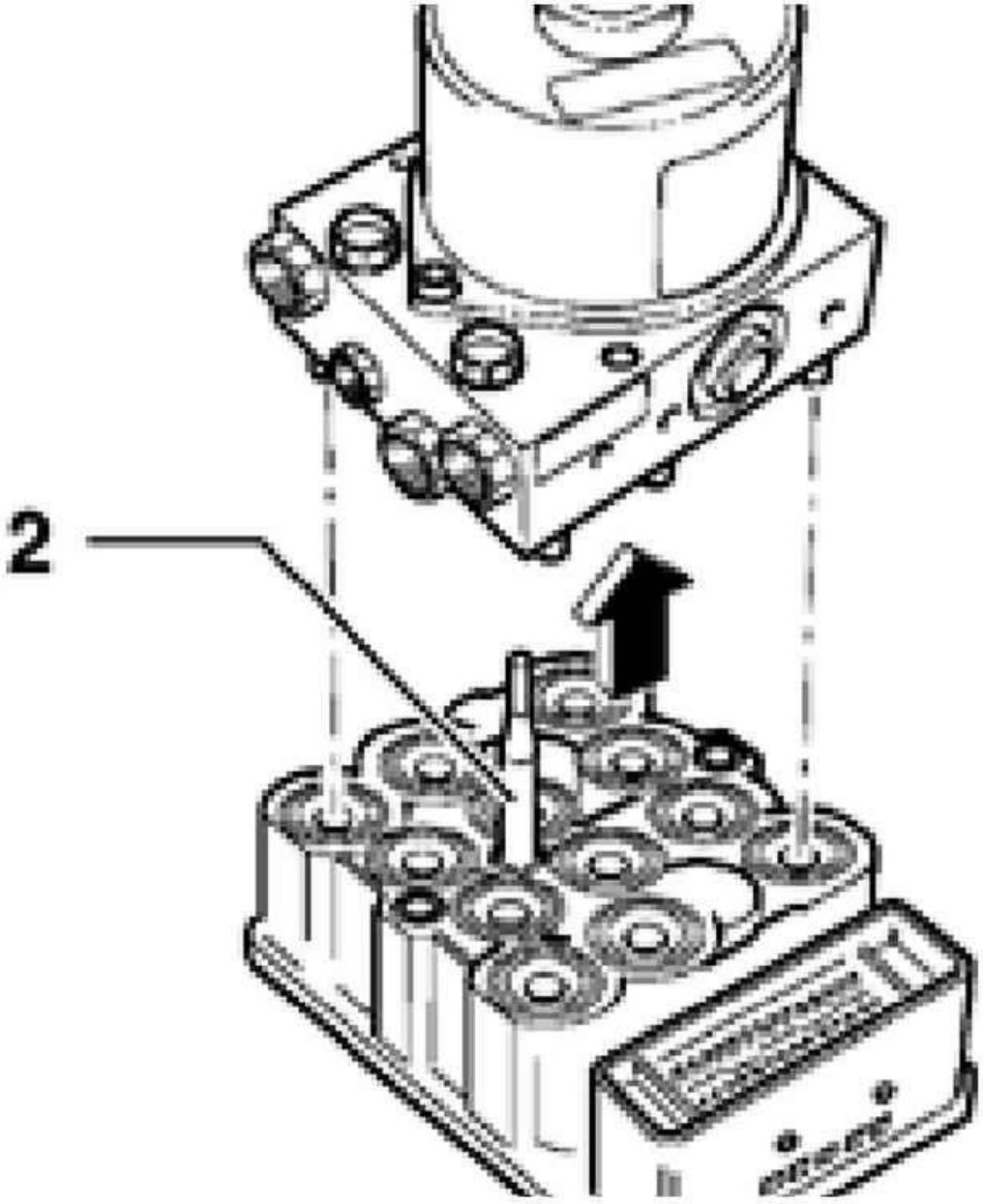


Fig. 45: Pulling Off Of Control Module
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Installing

NOTE:

- **Only remove sealing plugs on the new hydraulic unit when the corresponding brake line is going to be installed.**
- **If the sealing plugs are removed from the hydraulic unit too early, brake fluid can escape, it can no longer be guaranteed that the unit is sufficiently filled or adequately bled.**

When assembling the control module to the hydraulic unit, make sure that the hydraulic unit electrical contact pin is not tilted against the control module solenoid valves.

- Using new bolts, install control module to hydraulic unit. Observe max. tightening torque of 4 N.m (35 in. lb).
- Bolt ABS module to bracket.

Do not tighten bolts completely. Attaching the individual brake lines is made easier.

- After tightening brake lines, tighten hydraulic unit.
- Further installation is carried out in the reverse sequence.
- Remove brake pedal depressor VAG 1869/2.
- Bleed brake system, see Page 47-24
- Enter radio code.
- Coding control module.

See **ABS CONTROL MODULE, CODING** .

Tightening torques:

Control module to hydraulic unit : max.

4 N.m (35 in. lb

Hydraulic unit hex bolt to bracket 8 N.m (71 in. lb)

Tandem brake master cylinder to brake booster : 20 N.m (15 ft. lb)

Brake line to ABS assembly:

Thread M 10 x 1 : 14 N.m (10.33 ft. lb)

Thread M 12 x 1 : 14 N.m (10.33 ft. lb)

Hex nut to body : 20 N.m (15 ft. lb)

DTCS DISPLAYED BY (ABS) MARK 60 WARNING LAMPS -K32-, -K47-, -

K118-, AND -K155-

WARNING LAMPS

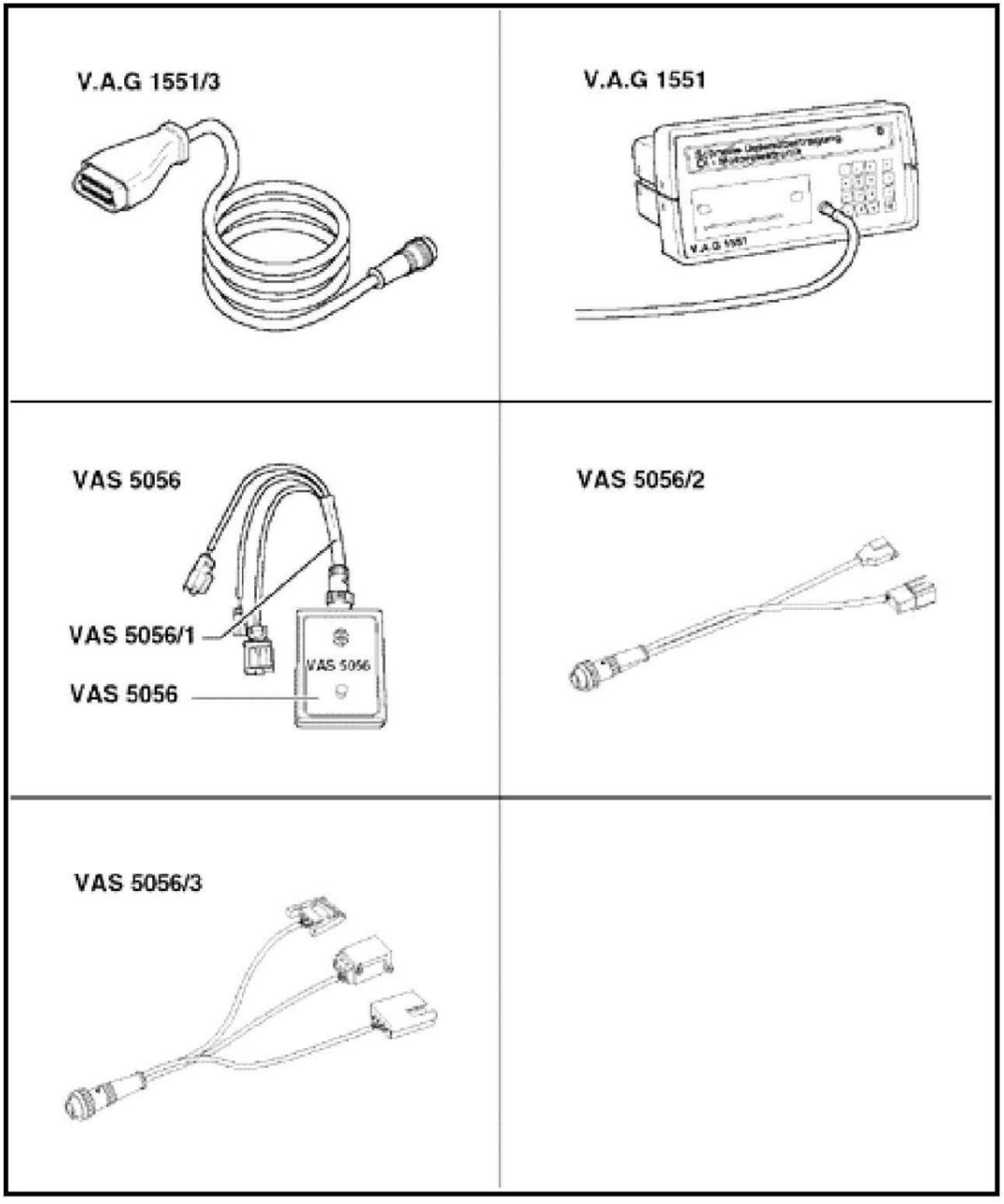


Fig. 46: Identifying Warning Lamps
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Brake pad wear indicator light -K32-

- If the brake pad wear indicator light -K32- -1- does not go out after ignition is switched on and test sequence is completed, or it lights up while driving, then the malfunction may be:

  -a- The brake pads can be worn out

  Check the front and rear brake pads.

  See **FRONT DISC BRAKE PADS** and **REAR DISC BRAKE PADS** .

  -b- There is a malfunction in the activation of the brake pad wear indicator light -K32-.

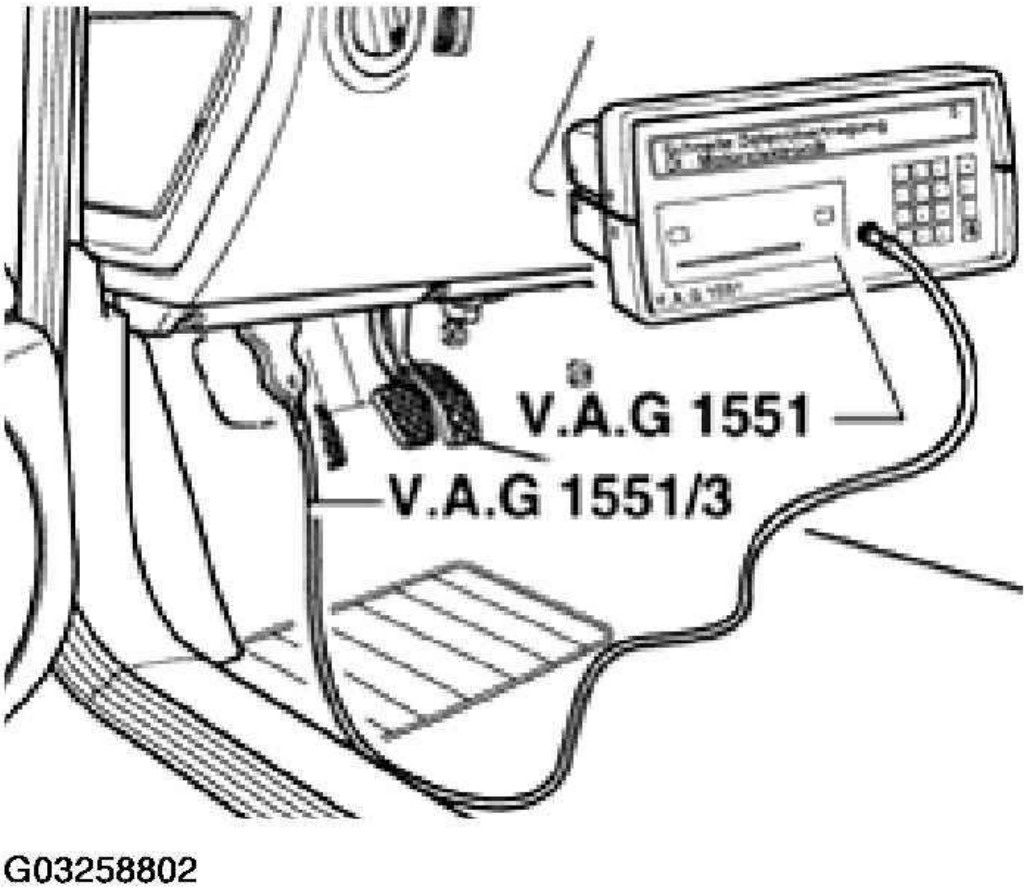


Fig. 47: Identifying Brake Pad Wear Indicator Light -K32-
Courtesy of VOLKSWAGEN OF AMERICA, INC.

ABS warning light -K47-

- If the ABS warning light -K47- -2- does not go out after ignition is switched off and test sequence is completed, then the malfunction may be:

  -a- Voltage supply is below 10 Volt.

  -b- There is a malfunction in the ABS.

  The anti-lock brake system remains switched off with an ABS malfunction -b-, but the brake system remains fully operational.

  -c- Since the last time the vehicle was started there was a temporary speed sensor malfunction.

  In the case of a sensor malfunction -c-, the ABS warning light -K47- will extinguish after restarting the engine and attaining a speed of above 20 km/h (approx. 13 mph).

  -d- The connection of instrument cluster to ABS control module (w/EDL) -J104- is interrupted.

  -e- Instrument cluster is faulty.

Fig. 48: Identifying ABS Warning Light -K47-
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Warning lamps -K47- and -K118-

- If the ABS warning light -K47-, -2-, goes out, but the warning light for brake system -K118-, -3-, remains on, then the malfunction may be:

  -a- The parking brake is applied.

  -b- The brake fluid level is too low.

  -c- There is a malfunction in the activation of the warning light for brake system -K118-.

- If the ABS warning light -K47- -2- and the warning light for brake system -K118- -3- light up, the ABS

system is faulty and the EBD (Electronic brake pressure distribution) is not functioning.

WARNING: After the ABS warning light - K47- and warning light for brake system -K118- have lighted up, it is possible that the rear wheels will lock up earlier.

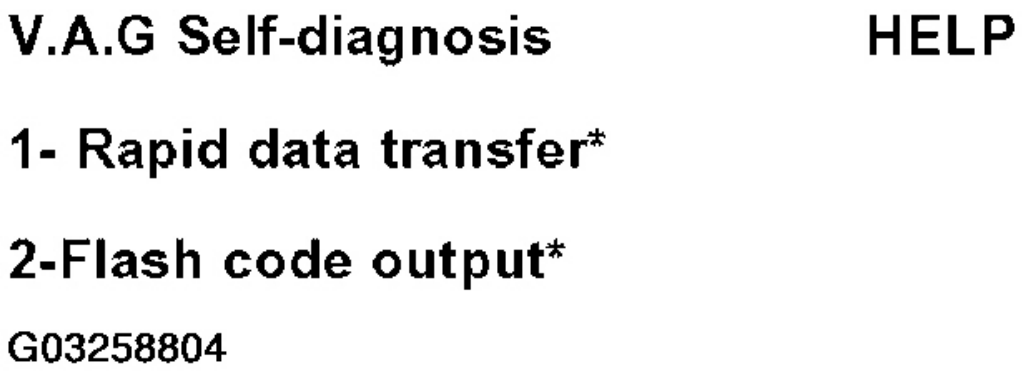


Fig. 49: Identifying Warning Lamps -K47- And -K118-
Courtesy of VOLKSWAGEN OF AMERICA, INC.

ASR/ESP control lamp -K155-

- If the stabilization program ASR/ESP control lamp -K155- -4- does not go out after ignition is switched off and test sequence is completed then the malfunction may be:

  -a- Short to positive in ASR/ESP button -E256-.

  -b- There is a malfunction in the activation of the stabilization program ASR/ESP control lamp -K155-.

  -c- The ASR/ESP has been switched off via button -E256-.

  There is a malfunction present which exclusively affects the safety systems of the ASR/ESP. The ABS/EDL and EBD safety systems of the vehicle remain fully functional.

  If stabilization program ASR/ESP control lamp -K155- flashes while driving, the ASR or ESP system is regulating the system.

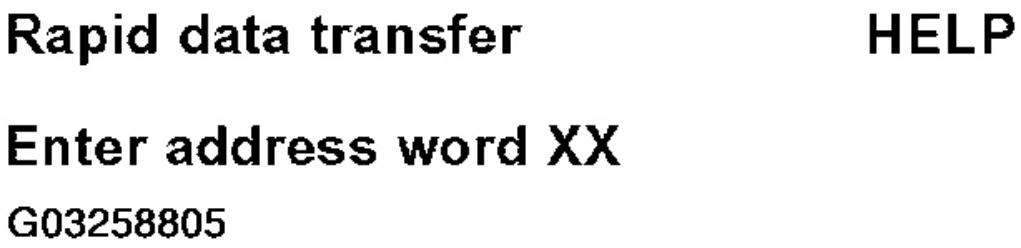


Fig. 50: Identifying ASR/ESP Control Lamp -K155-
Courtesy of VOLKSWAGEN OF AMERICA, INC.

ABS SYSTEM COMPONENTS ON FRONT AND REAR AXLE

ABS SYSTEM COMPONENTS ON FRONT AXLE, REMOVING AND INSTALLING

NOTE: Removing and installing ABS system components is identical for FS III and FN 3 brake calipers.

NOTE: The following list refers to items in Fig. 51 .

1. **ABS speed sensor**
   - Before inserting sensor, clean mounting hole inner surface and coat with lubricant G 000 650
2. **Wheel bearing housing**
3. **Hex socket head bolt, 8 N.m (71 in lb)**
4. **Splash plate**
5. **Hex bolt, 10 N.m (88 in. lb)**
6. **Wheel bearing**
   - Replace each time after removing
   - Pressing out and in

   See **WHEEL BEARING (WHEEL BEARING HOUSING INSTALLED**

7. **Phillips-head screw**
8. **Brake disc**
9. **Wheel hub with rotor**
   - Pressing out and in

See **WHEEL BEARING (WHEEL BEARING HOUSING INSTALLED**

10. **Circlip**

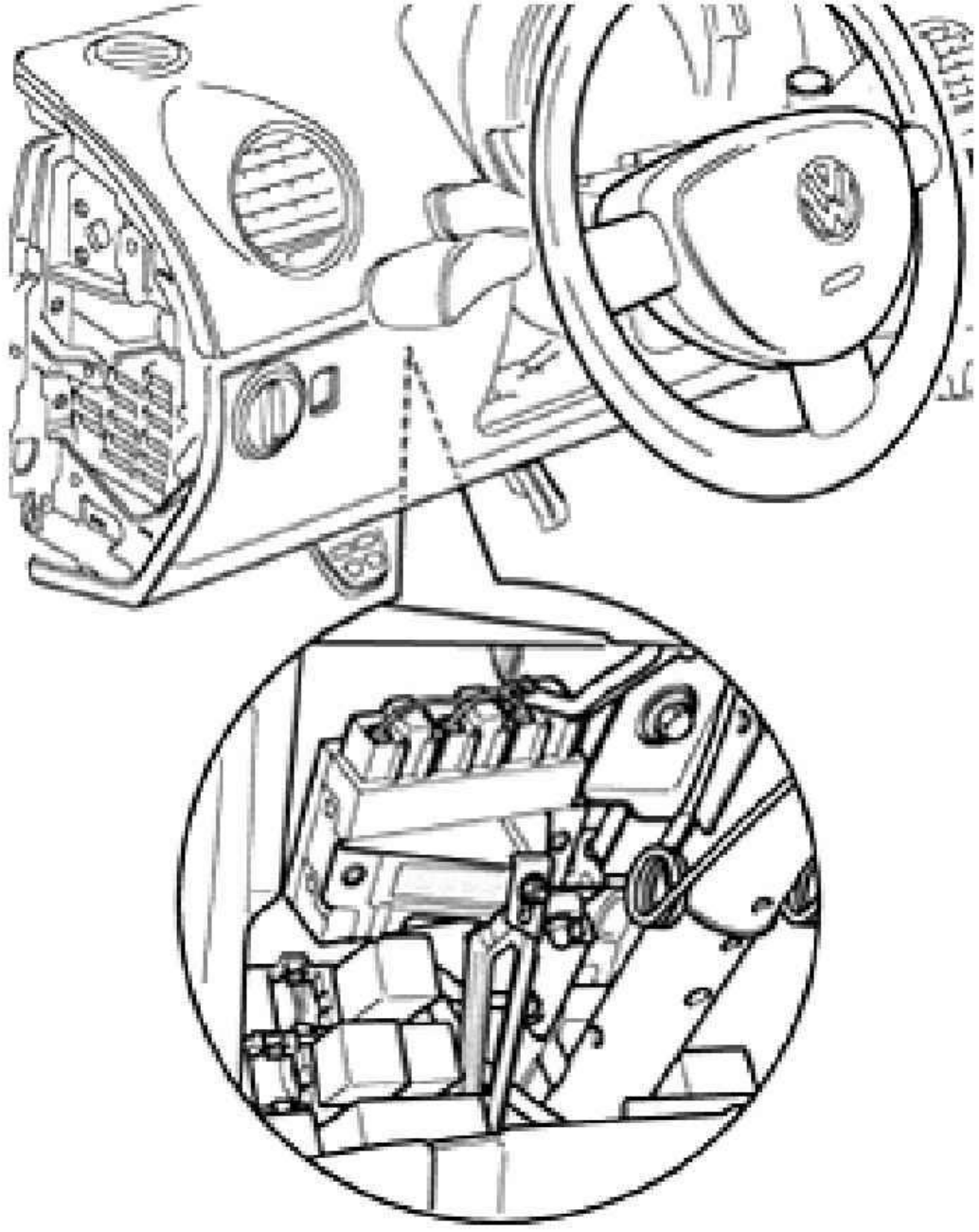


Fig. 51: Identifying ABS System Components On Front Axle - ABS MARK 60
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Removing and installing speed sensor on front axle

Removing

- Raise vehicle.
- Disconnect speed sensor and speed sensor wiring connector -1-.
- Remove bolt -2- from wheel bearing housing.
- Disconnect ABS speed sensor from wheel bearing housing.

Installing

- Before inserting speed sensor, clean hole inner surface and coat speed sensor with solid lubricant G 000 650.
- Insert speed sensor into hole in wheel bearing housing and tighten bolt to 8 N.m (71 in. lb).
- Connect speed sensor to speed sensor wiring.
- Turn wheels fully to left and right lock and check clearance of speed sensor wiring.

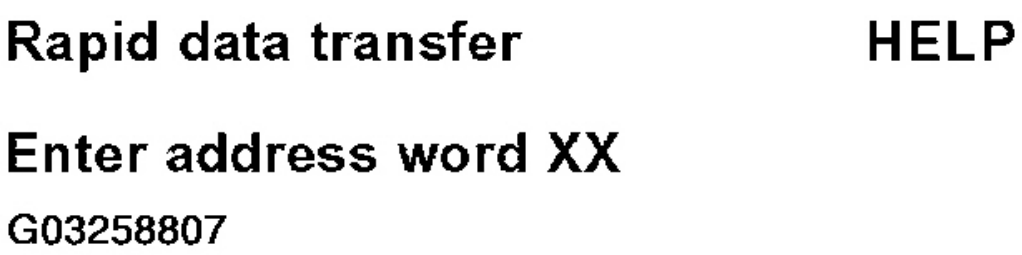


Fig. 52: Disconnecting Speed Sensor And Speed Sensor Wiring Connector
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Checking or removing and installing rotor on front axle

- Raise vehicle.
- Remove wheel.
- Rotate brake disc and check rotor is not damaged or dirty.
- If rotor is damaged, remove wheel hub with rotor and replace.

See **WHEEL BEARING (WHEEL BEARING HOUSING INSTALLED**

Checking rotor lateral run-out

- Raise vehicle.

- Remove wheel.
- Turn wheel hub and check gap -dimension a- between rotor and speed sensor is even.

  Dimension a = 0.3 mm (0.0118 in.)

- If rotor is damaged, remove wheel hub with rotor and replace.

  See **WHEEL BEARING (WHEEL BEARING HOUSING INSTALLED**

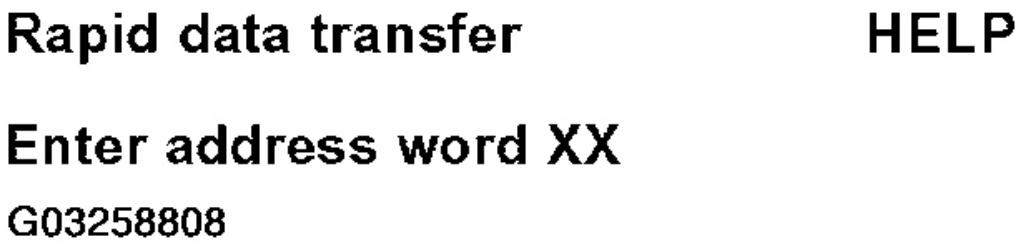


Fig. 53: Check Gap Between Rotor And Speed Sensor Is Even
Courtesy of VOLKSWAGEN OF AMERICA, INC.

FRONT SPEED SENSOR WIRING, REMOVING AND INSTALLING

Special tools and equipment

- VAS 1978 Wiring harness repair kit

Removing:

- Obtain radio code on vehicles with coded radio.
- Disconnect battery.

Fig. 54: Identifying VAS 1978 Wiring Harness Repair Kit

Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Disconnect intake hose -1- and connector -2- off mass air flow sensor.
- Remove bolts -3-, -4- and -5-.
- Remove air cleaner complete.

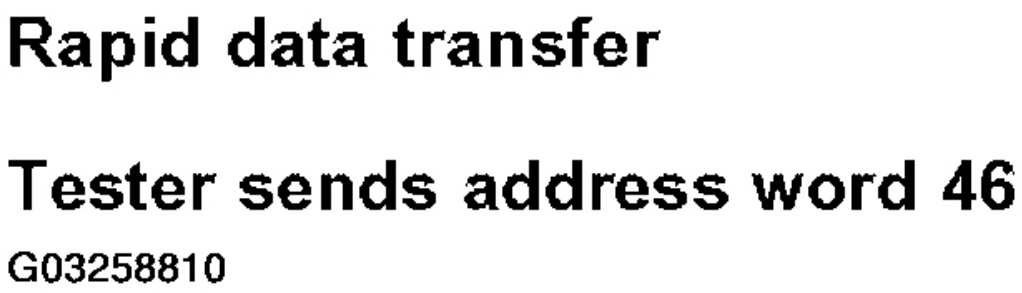


Fig. 55: Disconnecting Intake Hose And Connector Off Mass Air Flow Sensor
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Release control module connector (arrow -1-) and pull off (arrow -2-).

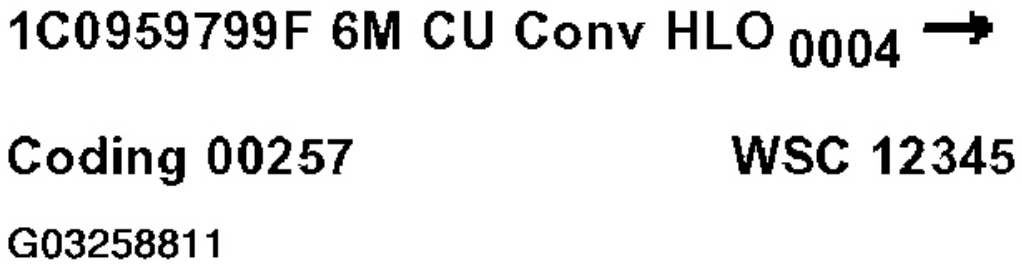


Fig. 56: Releasing Control Module Connector
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Release multi-pin connector cover cap with a screwdriver and remove.

Fig. 57: Releasing Multi-Pin Connector Cover Cap With A Screwdriver
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Release secondary locking device (violet) in direction of arrow with a little screwdriver.

Fig. 58: Releasing Secondary Locking Device In Direction Of Arrow With A Little Screwdriver
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Fig. 59: Identifying Connector T25 Wiring Harness Terminal
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Contact assignment of connector T25 wiring harness/ ABS Control Module (w/EDL) -J104-

Contact Connected to component

19 + 20 Right Front ABS Wheel Speed Sensor -G45-

1+2 Left Front ABS Wheel Speed Sensor -G47-

- Push out relevant contacts with an ejection tool from wiring harness repair kit VAS 1978.
- Separate connector from speed sensor wiring and speed sensor.

Fig. 60: Pushing Out Relevant Contacts With An Ejection Tool From Wiring Harness
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- In addition, disconnect connection -1- on vehicles with a brake pad wear indicator.

Fig. 61: Disconnecting Connection On Vehicles With A Brake Pad Wear Indicator
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Unclip the wiring from retainer -2-.
- Remove the faulty speed sensor wiring.

Installing

- Route the new speed sensor wiring.
- Connect speed sensor to speed sensor wiring.
- Clip in speed sensor wiring -arrows-.

Make sure the wiring is not twisted when installing the speed sensor wiring in the wheel housing.

- Insert brake wear indicator connector into retainer on suspension strut.
- Guide contacts into connector housing.

Fig. 62: Cliping In Speed Sensor
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Push individual wiring seals in onto stop with an insertion tool from VAS 1978.

Fig. 63: Pushing Individual Wiring Seals In Onto Stop With An Insertion Tool From VAS 1978
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Secure contacts with secondary locking device and install multi-pin connector cover cap.

ABS SYSTEM COMPONENTS ON REAR AXLE, REMOVING AND INSTALLING

NOTE: The following list refers to items in .Fig. 64

1. **ABS speed sensor**
   - Before inserting sensor, clean mounting hole inner surface and coat with lubricant G 000 650
2. **Hex socket head bolt, 8 N.m (71 in lb)**
3. **Stub axle**
4. **Splash plate**
5. **Hex bolt, 60 N.m (44 ft. lb)**
   - With dished spring
6. **Phillips-head screw**
7. **Brake disc**
8. **8-Cap**
   - Pressing off and driving in

   See **WHEEL BEARING**

9. **Self-locking 12-point nut, 175 N.m (129 ft. lb)**
   - Replace each time after removing
10. **Wheel hub with wheel bearing and rotor**
    - Only replace complete
    - Removing and installing

    See **WHEEL BEARING**

11. **Axle beam**

Fig. 64: Identifying ABS System Components On Rear Axle
Courtesy of VOLKSWAGEN OF AMERICA, INC.

SPEED SENSOR ON REAR AXLE, REMOVING AND INSTALLING

Removing

- Raise vehicle.
- Disconnect speed sensor and speed sensor wiring connector -1-.

- Remove bolt -2- from stub axle.
- Disconnect ABS speed sensor out of stub axle.

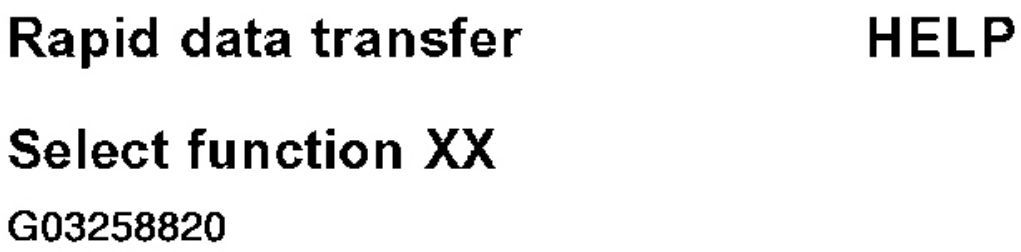


Fig. 65: Disconnecting ABS Speed Sensor Out Of Stub Axle
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Installing

- Before inserting speed sensor, clean hole inner surface and coat speed sensor with solid lubricant paste G 000 650.
- Insert speed sensor into hole in stub axle and tighten bolt to 8 N.m (71 in. lb)
- Connect speed sensor to speed sensor wiring.

Checking or removing and installing rotor on rear axle

- Raise vehicle.
- Remove wheel.
- Remove bolt for ABS speed sensor from stub axle.
- Disconnect ABS speed sensor out of stub axle.
- Check rotor is not damaged or dirty.
- If rotor is damaged, remove wheel hub with rotor and replace.

See **FRONT & REAR BRAKE ROTOR** and **WHEEL BEARING**

REAR SPEED SENSOR WIRING, REMOVING AND INSTALLING

Special tools and equipment

- VAS 1978 Wiring harness repair kit

Removing:

- Obtain radio code on vehicles with coded radio.
- Disconnect battery.
- Separate speed sensor wiring/speed sensor connection.
- Remove rear side panel trim.

  See **SIDE PANEL TRIM, REMOVING AND INSTALLING** .

- Disconnect speed sensor wiring -arrow- with wire strippers from VAS 1978 and remove faulty wiring.

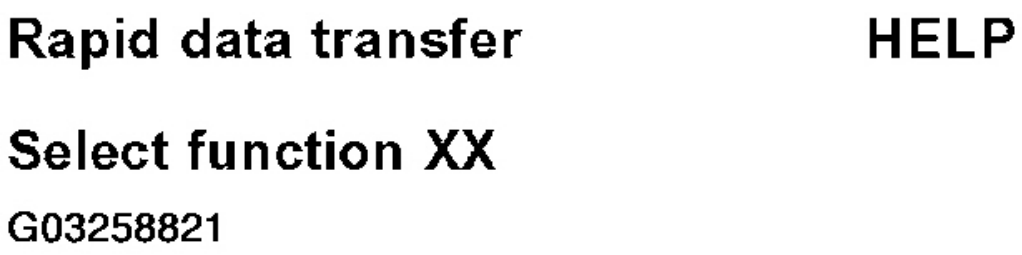


Fig. 66: Disconnecting Speed Sensor Wiring With Wire Strippers From VAS 1978
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Strip 15 mm (5/8 in.) of insulation from end of wire with wire stripper and fold half of stripped wire back.
- Guide in new speed sensor wiring.
- Connect speed sensor to speed sensor wiring.
- Clip in speed sensor wiring -arrow-.

  Make sure the wiring is not twisted when installing the speed sensor wiring in the wheel housing.

- Cut 2-pin connector off new speed sensor wiring with wire stripper pliers.
- Strip 15 mm (5/8 in.) of insulation from end of wire with wire strippers and bend back half.

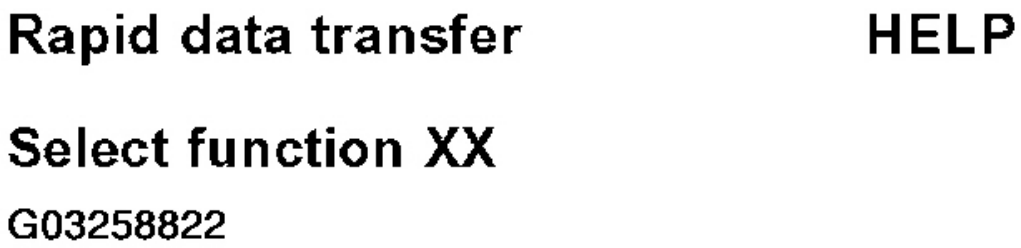


Fig. 67: Striping 15 Mm Of Insulation From End Of Wire With Wire Stripper
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Connect speed sensor wiring with help of suitable crimp connector from wiring harness repair kit VAS 1978.

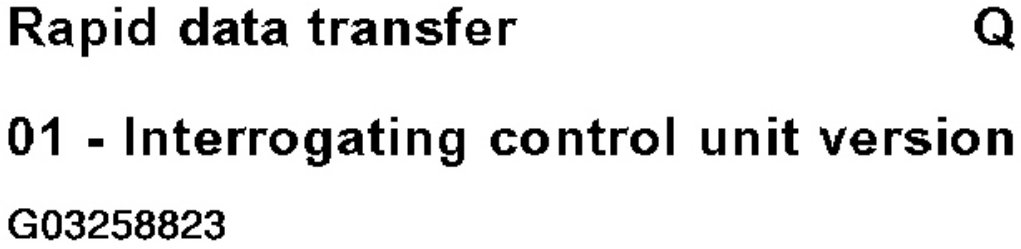


Fig. 68: Cliping In Speed Sensor Wiring
Courtesy of VOLKSWAGEN OF AMERICA, INC.

ESP SYSTEM COMPONENTS, REMOVING AND INSTALLING

SENDER FOR ROTATION RATE -G202- AND SENSOR FOR TRANSVERSE ACCELERATION -G200-, REMOVING AND INSTALLING

NOTE: The removal and installation sequence for the sender for rotation rate -G202- and the sensor for transverse acceleration -G200- is identical except for the mounting bracket for each component.

Removing

- Request radio code on vehicles with coded radio.
- Disconnect battery.
- Pry off cover cap -1- and remove screws -2-.

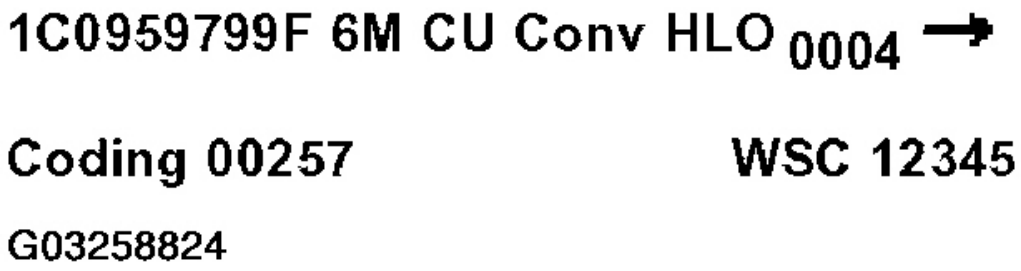


Fig. 69: Prying Off Cover Cap And Removing Screws
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Take switch mounting -3- off bracket.
- Release cover -1- from rear of instrument panel and pull off.

Fig. 70: Releasing Cover From Rear Of Instrument Panel
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Remove screw -2- and screws -3-.
- Turn rotary knob -1- of lighting switch to 0 position.
- Press rotary knob inward -arrow A- and turn to the right -arrow B-.

Fig. 71: Pressing Rotary Knob Inward And Turning To Right
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Disconnect switch out of instrument panel -arrow C- and disconnect connector.
- Unclip headlight range control switch -2- and disconnect connector.
- Remove screw (under a cover cap) -arrow- from glove box -1-.

Fig. 72: Removing Screw From Glove Box
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Remove the four screws -1-.
- Unclip trim -2- at top and take off instrument panel.
- Remove the six screws -3-.
- Remove impact plate -4-.

Fig. 73: Removing Four Screws
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Location: The sender for rotation rate -G202- -1- and the sensor for transverse acceleration -G200- -2- are secured to a bearing bracket on the steering column -3-.

Fig. 74: Locating Sender For Rotation Rate -G202- (-1-) And Sensor For Transverse Acceleration -G200-
Courtesy of VOLKSWAGEN OF AMERICA, INC.

a. Steering column

- Pull connector -arrow- off sender for rotation rate -G202- and pull connector off sensor for transverse acceleration -G200-.
- Remove bolt -1- and take out sender for rotation rate -G202- and sensor for transverse acceleration -G200-.

Fig. 75: Removing Bolt And Take Out Sender For Rotation Rate -G202- And Sensor For Transverse Acceleration -G200-
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Removing sender for rotation rate -G202-

- Remove nuts -a- from sender for rotation rate - G202- -1-.
- Take out sender for rotation rate -G202-.

Fig. 76: Removing Nuts From Sender For Rotation Rate - G202-
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Removing sensor for transverse acceleration -G200-

- Pry retainer -1- off sensor for transverse acceleration -G200- -2- using a screwdriver.
- Take out sensor for transverse acceleration -G200-.

Fig. 77: Prying Retainer Off Sensor For Transverse Acceleration -G200- Using A Screwdriver
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Installing

Installing sender for rotation rate -G202-

- Insert sender for rotation rate -G202- and align so that it is straight.
- Install nuts -a- and tighten so that the sender for rotation rate -G202- -1- is secure.

Fig. 78: Installing Nuts And Tightening So Sender For Rotation Rate -G202- Is Secure
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Installing sensor for transverse acceleration -G200-.

- Insert lateral acceleration sensor -G200- in bracket.
- Installation position: The angled section -arrow- of the lateral acceleration sensor -G200- -1- must face toward the retainer -2-.
- Slide retainer -2- over the lateral acceleration sensor -G200- -1- until it locks in position.

  Further installation in reverse order

- Enter radio code.

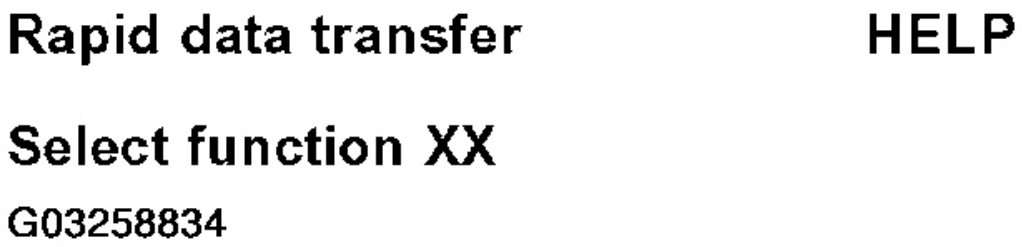


Fig. 79: Identifying Angled Section Of Lateral Acceleration Sensor -G200-
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Tightening torques:

Sender for rotation rate -G202- to bracket : 9 N.m : (79 in. lb)

Hex bolt to steering column mounting bracket : 20 N.m : (15 ft. bracket lb)

ESP-SENSOR UNIT -G419-, VEHICLES FROM M.Y. 12.01, REMOVING AND INSTALLING

The sensor for transverse acceleration -G200-, and the sender for rotation rate -G202- are assembled together in one housing on a new bracket, at the same place in the vehicle.

- The ESP-sensor unit -G419- -1- is fixed with a bracket on the steering column bearing bracket -a-.

When the ESP-sensor unit -G419- is replaced, a zero compensation of the sensor for transverse acceleration -G200-, and the sender for rotation rate -G202-, must be performed.

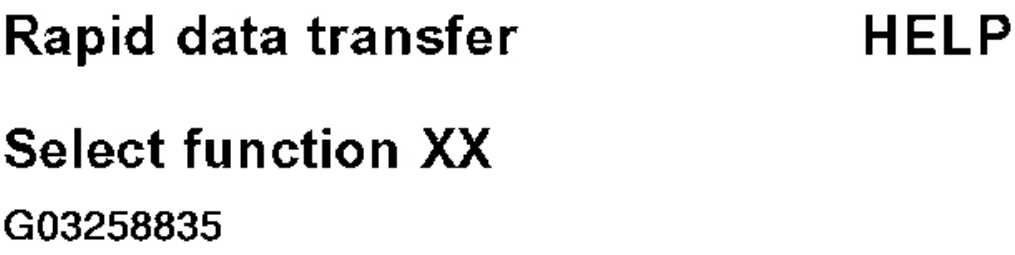


Fig. 80: Locating ESP-Sensor Unit -G419-

Courtesy of VOLKSWAGEN OF AMERICA, INC.

Removing

- Pull off connector -arrow- from ESP-sensor unit -G419-
- Unscrew bolt -1- and remove ESP-sensor unit -G419-

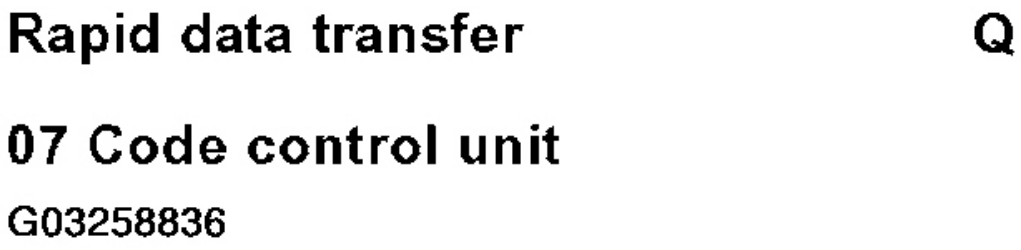


Fig. 81: Pulling Off Connector From ESP-Sensor Unit -G419-
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Unscrew nuts -a- from the ESP-sensor unit -G419-
- Remove ESP-sensor unit -G419-

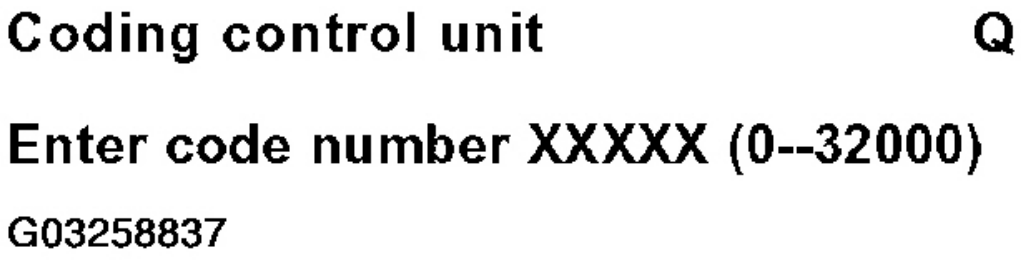


Fig. 82: Identifying Nuts From ESP-Sensor Unit -G419-
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Installing

Further installation in reverse order

Tightening torques:

ESP-sensor unit -G419- to bracket : 9 N.m : (79.7 in. lb)

Hex bolt to steering column mounting bracket : 20 N.m : (15 ft. lb)

- Enter radio code.
- Perform basic settings of sensor for transverse acceleration -G200- and sender for rotation rate -G202-.

  See **INITIATING BASIC SETTING** .

STEERING ANGLE SENSOR -G85-, REMOVING AND INSTALLING

Removing

- Removing airbag module and steering wheel.

  See **DRIVER-SIDE AIR BAG MODULE** and **STEERING WHEEL** .

- Turn wheels to straight ahead position.
- Take out covering in footwell.
- Remove bolts -1-.
- Take off handle for height and reach adjustment -5-.

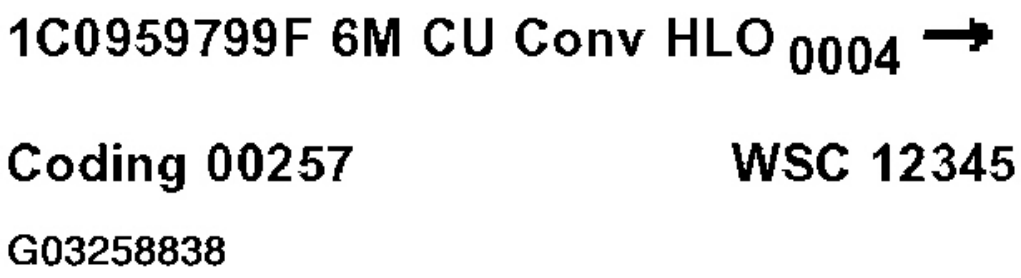


Fig. 83: Locating Handle For Handle For Height And Reach Adjustment & Lower Steering Column Switch Trim
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Unscrew bolts -2-, -3- and -4-.
- Take off lower steering column switch trim.
- Remove upper steering column switch trim -1-.

Fig. 84: Removing Upper Steering Column Switch Trim
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- The steering angle sensor -G85- is installed in a housing -1- together with the coil connector.

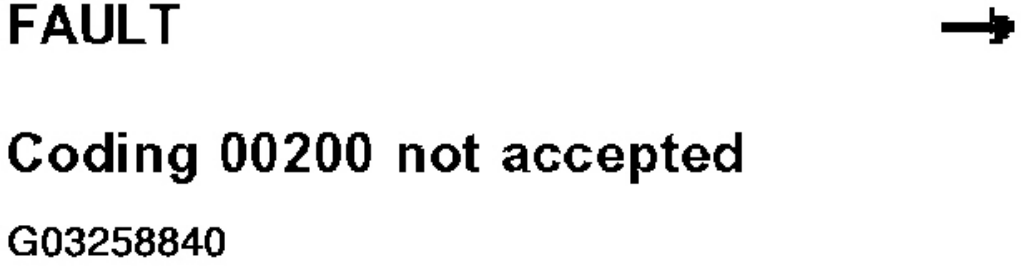


Fig. 85: Installing In A Housing Together With Coil Connector
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Pull off connectors -1- and -2-.

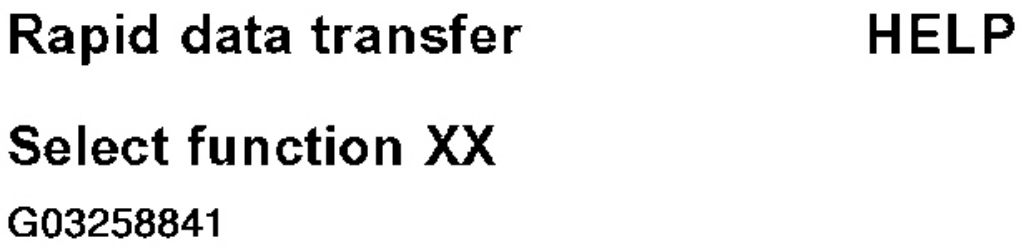


Fig. 86: Pulling Off Steering Column Connectors
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Lift hooks -arrows- carefully and remove steering angle sensor -G85-.

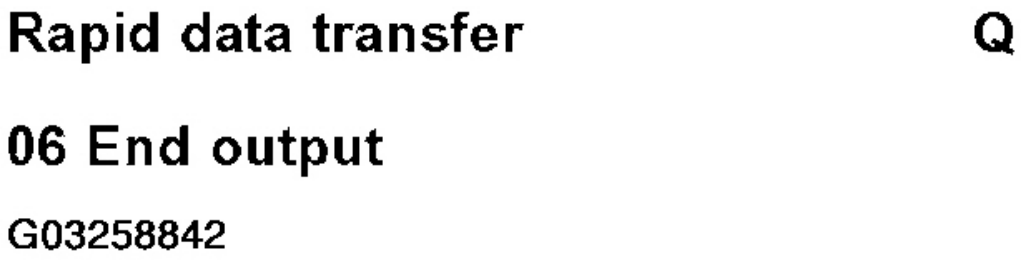


Fig. 87: Removing Steering Angle Sensor -G85-
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Installing

The steering angle sensor -G85- must be set to it's centered position before installing.

- Position steering angle sensor -G85- and push down until the lugs engage.
- Remove transportation protection.
- A yellow mark must be visible in hole-arrow 1-.

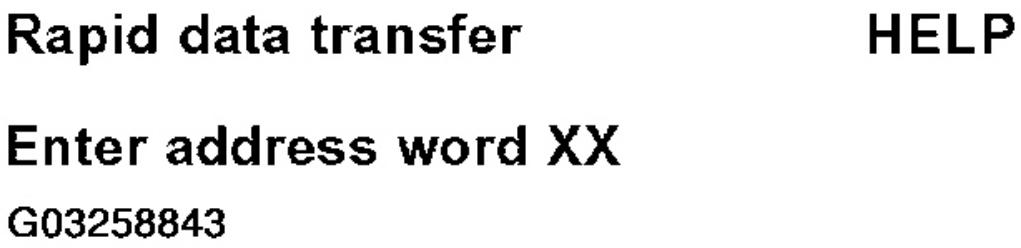


Fig. 88: A Yellow Mark Must Be Visible In Hole -Arrow 1-
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- The marks -arrows- must also align.

Make sure it does not move from center position.

Further installation in reverse order

- Installing airbag module and steering column.

  See **DRIVER-SIDE AIR BAG MODULE** and **STEERING WHEEL** .

- Perform steering angle sensor -G85- basic settings.

  See **INITIATING BASIC SETTING** .

ITT MARK 20 IE ON BOARD DIAGNOSTIC (OBD), GENERAL INFORMATION

FUNCTION

Since the control modules are interconnected with a Controller Area Network bus (CAN-bus), always start troubleshooting by pressing buttons -0- and -0- to insert "Automatic Test Sequence" address word 00. This checks DTC memory for all control modules in the vehicle, including those that may influence the ABS system in case of malfunction.

On Board Diagnostic (OBD) relates to the electrical and electronic components of the ABS; in other words, only malfunctions pertaining to the electrical connections to the control module are recognized (e.g. wheel speed sensor, open circuit).

The 25-pin ABS Control Module (w/EDL) -J104- and the ABS hydraulic unit together form a compact module. The control module is equipped with DTC memory, and is located on the left side of the engine compartment. The Data Link Connector (DLC) is located left of the steering column under the instrument panel. Only early production cars DLC is in the center console below the heating and air conditioning controls.

The control module recognizes malfunctions during vehicle operation and stores them as Diagnostic Trouble Codes (DTC) in permanent memory. The DTCs remain in memory if the voltage from the battery is interrupted.

Sporadic malfunctions will also be recognized and stored. If these do not occur again within the next 50 vehicle starts and driving cycles DTC memory will be erased (with the exception of "Control Module Malfunctioning").

Sporadic malfunctions are identified as such by "/SP" appearing on the VAG1551 Scan Tool (ST) display.

After switching the ignition on and/or starting the engine, ABS warning light -K47- and brake system warning lamp -K118- (red) lights up for approx. 2 seconds. During this period a test sequence (self-test) is run in the control module, checking the following:

- Voltage supply (at least 10.0 volts)
- Control module, including valve windings
- Wheel speed sensor; electrical check fully completed at 20 km/h (approx. 13 mph)
- Control module coding
- If after driving off and exceeding a speed of approx. 20 km/h (approx. 13 MPH) the speed signal is not OK. The ABS warning light -K47- will light up again.

VAG1551 Scan Tool (ST) or tester VAS 5051

The On Board Diagnostic (OBD) program must be initiated at the start of troubleshooting. Electrical malfunctions which influence braking characteristics will be stored, and can only be checked with the

VAG1551 Scan Tool (ST) or with the tester VAS 5051.

The following procedures refer only to the VAG1551 scan tool.

The malfunction information displayed is used in conjunction with a DTC table, which has information on the possible cause of malfunctions and specific corrective actions.

IDENTIFICATION

Left-hand drive

The brake booster boost is produced by vacuum pressure.

Distinguishing features:

1. 10" brake booster
2. Hydraulic unit
3. Control module, 25-pin (bolted to hydraulic unit)

Fig. 1: Identifying ABS Left-Hand Drive Distinguishing Features (ITT Mark 20 IE)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Right-hand drive

The brake booster boost is produced by vacuum pressure.

Distinguishing features:

1. 7"/8" brake booster
2. Hydraulic unit
3. Control module, 25-pin (bolted to hydraulic unit)

Fig. 2: Identifying ABS Right-Hand Drive Distinguishing Features (ITT Mark 20 IE)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Distinguishing features of ABS & ABS/EDL (ITT Mark 20 IE hydraulic unit), left and right-hand drive

NOTE: The following list refers to items in Fig. 3 .

- Dimension -A-: 100 mm (vehicles with ABS)
- Dimension -A-: 130 mm (vehicles with ABS/EDL)
- Dimension -A: -130 mm vehicles with ABS/EDL/ASR

Fig. 3: Distinguishing Features Of ABS & ABS/EDL (ITT Mark 20 IE hydraulic unit) - Left And Right-Hand Drive
Courtesy of VOLKSWAGEN OF AMERICA, INC.

TECHNICAL DATA

ABS Control Module (w/EDL) -J104-

When checking DTC memory, the control module identification will be displayed on the VAG1551 scan tool.

1J0 907 379D: ABS

1J0 907 379 E: ABS/EDL

1 J0 907 379 R / J - ABS/EDL/ASR

Diagnostic Trouble Code (DTC) memory

Permanent memory (DTC memory) contents remain even without a supply voltage.

Data output

Data output is achieved using "Rapid data transfer" operating mode 1.

SAFETY PRECAUTIONS AND GENERAL TROUBLESHOOTING INFORMATION

CAUTION:

- **ABS is a vehicle safety system; the appropriate knowledge is necessary to work on the system.**
- **In order to check complaints and to be able to carry out specific troubleshooting, DTC memory must be checked before beginning work on the ABS system.**
- **Only disconnect harness connectors when the ignition is switched off.**
- **Observe the appropriate instructions regarding the handling of brake fluid, see SAFETY PRECAUTIONS .**

  See .

- **ABS malfunctions are indicated by the ABS warning lamp lighting up; certain malfunctions will only be recognized at speeds above 20 km/h (approx. 13 mph) (road test).**
- **If the ABS Warning Light -K47- and the warning light for brake system -K118- warning lamps do not light up, but the brake system is not functioning correctly, check the conventional braking system.**

Necessary technical information

See SYSTEM WIRING DIAGRAMS in ELECTRICAL.

See **DISC** and **ANTI-LOCK BRAKE SYSTEM** .

Road test

WARNING:

- **If you drive the vehicle after a malfunction has been detected by OBD, bear in mind that the function of the brake system is limited, and there is a risk of accident. The brake pressure at the rear wheels is no longer controlled by the Electronic Brake Distribution (EBD) function. This can result in excessive braking at the rear, and the vehicle may skid unexpectedly under braking.**

- **When driving or riding in an airbag-equipped vehicle, NEVER hold the scan tool or other test equipment in your hands or lap while in motion. Objects between you and the airbag increase the risk of injury in an accident.**
- **During a test drive in an airbag-equipped vehicle, test equipment must always be fastened to and operated from the rear seat by a second technician.**

SAFETY PRECAUTIONS

Changing brake fluid: see **BRAKE FLUID, CHANGING** .

WARNING: Brake fluid is poisonous.

CAUTION:
- **Brake fluid must not contact painted parts.**
- **Brake fluid absorbs moisture from the air and must therefore be replaced every two years. Use only new, unused and approved brake fluid that complies with MVSS 116 DOT 4.**
- **Do not use silicone-based brake fluid (DOT 5). Even the smallest traces can cause severe corrosion in the brake system.**

If one or two chambers in the brake fluid reservoir are completely empty (e.g. leaks in braking system) bleed the hydraulic unit with the VAG 1551 or VAS 5051 Scan Tool in "basic setting" function.

See

CAUTION: Do not exceed filling pressure of 1 bar (14.5 psi) when filling brake fluid using VAS 5234. The brake system will not be completely bled if excessive pressure is used.

ABS & ABS/EDL TROUBLESHOOTING FLOW CHART V.A.G 1551 SCAN TOOL / TESTER VAS 5051

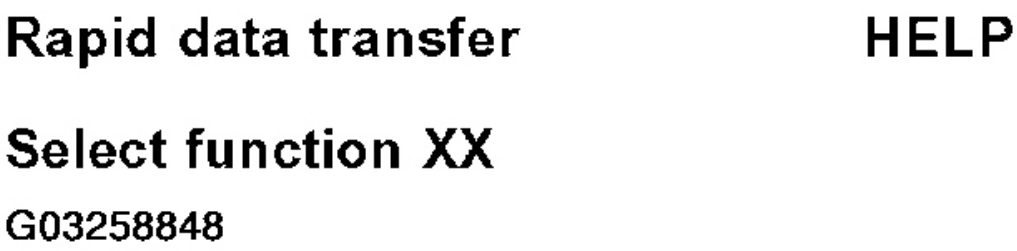


Fig. 4: ABS & ABS/EDL Troubleshooting Flow Chart V.A.G 1551 Scan Tool / Tester VAS 5051 (1 Of 2)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Fig. 5: ABS & ABS/EDL Troubleshooting Flow Chart V.A.G 1551 Scan Tool / Tester VAS 5051 (2 Of 2)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

ELECTRICAL/ELECTRONIC COMPONENTS AND INSTALLATION LOCATIONS

NOTE: The following list refers to items in Fig. 6 .

1. **ABS hydraulic unit -N55-**

   The hydraulic unit consists of the following components:

   - ABS hydraulic pump -V64-[1])
   - Valve block (contains the inlet and outlet valves)
   - ABS hydraulic pump -V64- and valve block must not be separated from one another. See **ANTI-LOCK BRAKE SYSTEM** .

- When changing hydraulic unit, always seal old part with plugs from repair set Part No. 1H0 698 311 A
- Multi-pin harness connector terminal assignment, see **MULTI-PIN HARNESS CONNECTOR WITH TERMINAL ASSIGNMENT**

CAUTION: Part numbers are listed here for reference only. Always check with your Parts department for the latest information.

2. **ABS control module -J104-**
   - Checked by On Board Diagnostic (OBD)
   - Located on hydraulic unit in left side of engine compartment
   - Removing and installing

     See **ABS CONTROL MODULE AND HYDRAULIC UNIT, REMOVING AND INSTALLING** .

   - Checking multi-pin harness connector to control module, see **MULTI-PIN HARNESS CONNECTOR WITH TERMINAL ASSIGNMENT**
   - Before disconnecting harness connector:
     - Check DTC memory.
     - Switch ignition off before separating harness connector.
3. **ABS/EDL hydraulic unit -N55-**

   The hydraulic unit consists of the components:

   - ABS hydraulic pump -V64-[1])
   - Valve block (contains the inlet and outlet valves)
   - ABS hydraulic pump -V64- and valve block must not be separated from one another.
   - When changing hydraulic unit, always seal old part with plugs from repair kit Part No. 1H0 698 311 A
   - Multi-pin harness connector terminal assignment, see **MULTI-PIN HARNESS CONNECTOR WITH TERMINAL ASSIGNMENT**

CAUTION: Part numbers are listed here for reference only. Always check with your Parts department for the latest information.

4. **ABS/EDL and ABS/EDL/ASR control module -J104-**
   - Checked by On Board Diagnostic (OBD)
   - Located on hydraulic unit in left side of engine compartment
   - Checking multi-pin harness connector to control module, see **MULTI-PIN HARNESS CONNECTOR WITH TERMINAL ASSIGNMENT**

- Before disconnecting harness connector:
  - Check DTC memory.
  - Switch ignition off before separating harness connector.

5. **Brake light switch -F-**
   - Open in rest position
   - Adjusting, see **BRAKE LIGHT SWITCH, ADJUSTING**
   - Can be checked via Read Measuring Value Block, see **READ MEASURING VALUE BLOCK (FUNCTION 08)**
6. **Data Link Connector (DLC)**
   - Installation position: Current model (DLC) location is left of steering column, under the instrument panel. Early production is at the center console below heating/air conditioning controls.
7. **ASR/ESP Control Lamp -K155- (only for vehicles with ASR)**
   - Location: In instrument cluster
8. **Warning light for brake system -K118-**
   - Location: in instrument cluster
   - Function, see **PARKING BRAKE INDICATOR LIGHT -K14-/WARNING LIGHT FOR BRAKE SYSTEM -K118-**
9. **ABS warning light -K47-**
   - Location: in instrument cluster
   - Function, see **WARNING LIGHTS**
10. **ABS wheel speed sensors -G45-/-G47- (front)**
    - Checked by On Board Diagnostic (OBD)
    - Before inserting sensor clean inner surface of sensor mounting and coat with lubricating paste G 000 650
    - When connecting wheel speed sensor wire make sure it is not twisted in wheelhousing
    - Securing bolt tightening torque: 10 N.m (7 ft lb)
11. **Wheel hub with wheel speed sensors rotor (front)**
    - Removing and installing

      See **SUSPENSION - FRONT (GOLF/JETTA/GTI FROM LATE 1999 PRODUCTION)** .

12. **ABS wheel speed sensor -G44-/-G46- (rear)**
    - Checked by On Board Diagnostic (OBD)
    - Installing, see item 10
13. **Wheel hub with wheel speed sensor rotor (rear)**
    - Removing and installing

      See **SUSPENSION - FRONT (GOLF/JETTA/GTI FROM LATE 1999 PRODUCTION)** .

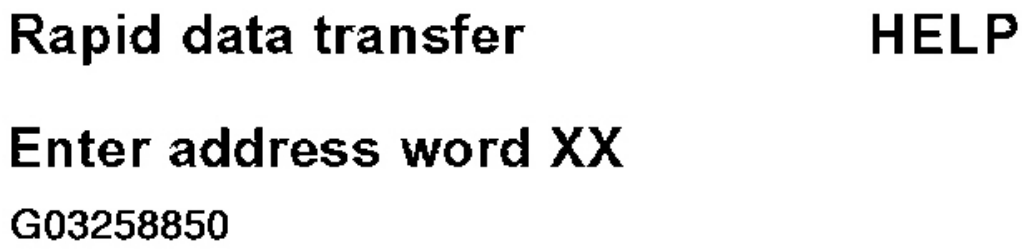


Fig. 6: Identifying Electrical/Electronic Components And Installation Locations (ITT Mark 20 IE)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

DIAGNOSTIC TROUBLE CODES (DTC) DISPLAYED BY WARNING LIGHTS -K14-, -K47- AND -K118-

Warning lights

WARNING LIGHTS CHART

Item	Designation
1	Warning light for brake system -K118-
2	ABS warning light -K47-
3	Parking brake indicator light -K14-

For vehicles with ABS/EDL/ASR and/or a radio/navigation system, the warning light for brake system -K118- is at position -3-. See **Fig. 7** . The function of the parking brake warning light -K14- is then taken on by the warning light for brake system -K118-.

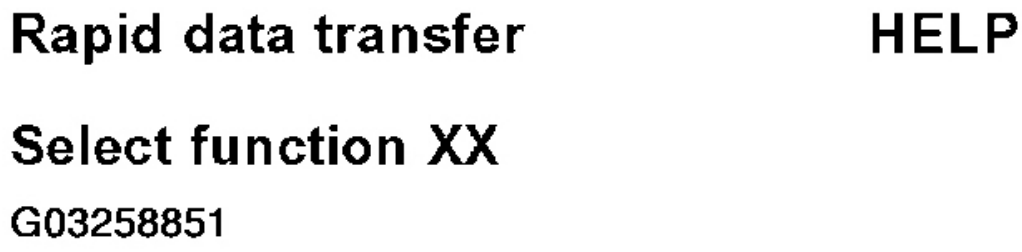


Fig. 7: Identifying Warning Light For K14, K47 And K118

Courtesy of VOLKSWAGEN OF AMERICA, INC.

WARNING LIGHTS

ABS warning light -K47-

If ABS warning light -K47- (-2-) does not go out after switching the ignition on and completion of test sequence, the malfunction may be:

a. Voltage supply is below 10 volts
b. ABS malfunction

   The anti-locking brake system remains switched off with an ABS malfunction (b), but the brake system remains fully operational.

c. Sensor malfunction after last starting the vehicle (sporadic)

   In the case of sensor malfunction (c) ABS warning lamp will go out after restarting the engine and at a road speed of above 20 km/h (approx. 13 mph).

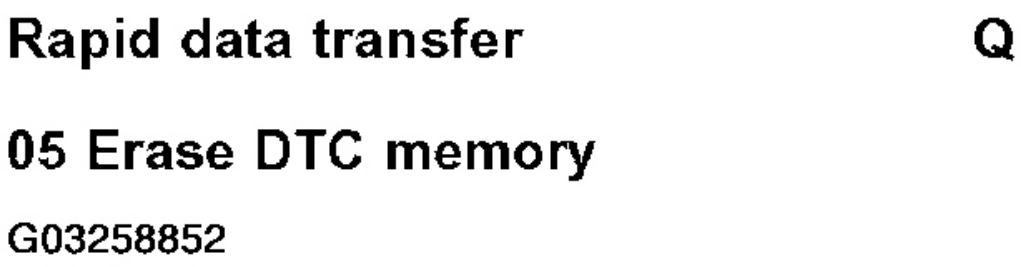


Fig. 8: Identifying ABS Warning Light -K47-
Courtesy of VOLKSWAGEN OF AMERICA, INC.

d. Open circuit between instrument cluster connector T32 (blue) pin 19 to control module pin 16
e. Instrument cluster malfunction

Parking brake indicator light -K14-/Warning light for brake system -K118-

If the parking brake indicator light -K14- (-3-/-1-), or on vehicles with the navigation system the warning light for brake system -K118-, does not go out after switching the ignition on, the malfunction may be:

a. Parking brake is applied

b. Switch for the parking brake indicator light -K14- is malfunctioning or incorrectly adjusted
c. There is a wiring malfunction

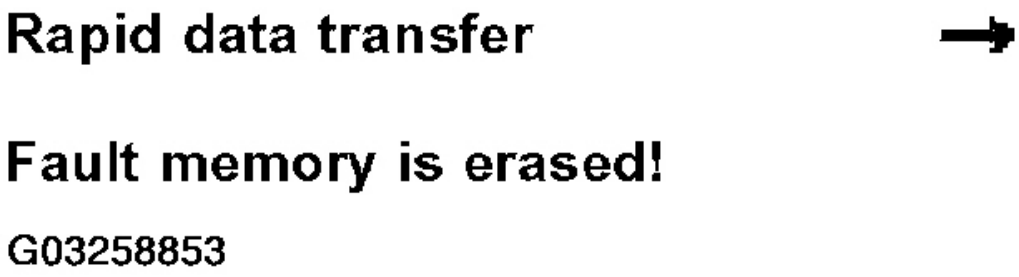


Fig. 9: Identifying Parking Brake Indicator Light -K14-/Warning Light For Brake System -K118-
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Vehicles with ABS/EDL

Complaint: "Vehicle has no EDL function"

For this complaint a possible cause of the malfunction may be that the brake light switch is incorrectly adjusted, see **BRAKE LIGHT SWITCH, ADJUSTING** .

A further possible cause of the malfunction may be that the brake light switch is not functioning. See **READ MEASURING VALUE BLOCK (FUNCTION 08)** , display group 003.

ON BOARD DIAGNOSTIC (OBD), INITIATING

NOTE: This On Board Diagnostic (OBD) is for the ITT Mark 20 IE system.

All functions which could previously be performed with V.A.G 1551 can also be performed with the new tester VAS 5051.

SPECIAL TOOLS AND EQUIPMENT

- VAG1551 Scan Tool (ST) or VAG1552 mobile scan tool

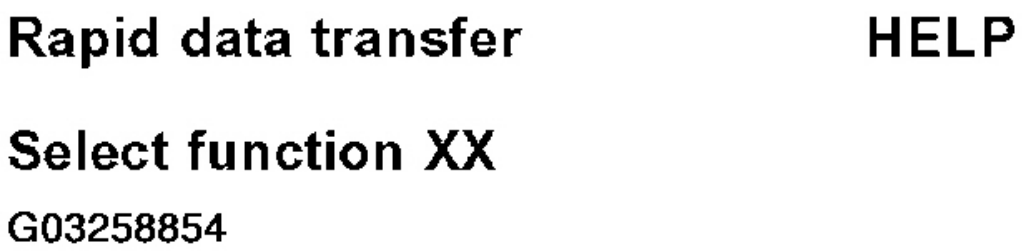


Fig. 10: Identifying VAG1551 Scan Tool (ST) Or VAG1552 Mobile Scan Tool
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- VAG1551/3 or VAG1551/3A adapter cable

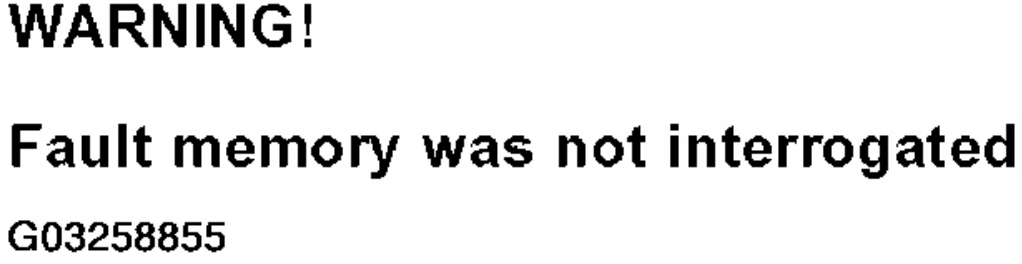


Fig. 11: Identifying VAG1551/3 or VAG1551/3A Adapter Cable
Courtesy of VOLKSWAGEN OF AMERICA, INC.

REQUIREMENTS

- The tires installed on the wheels must all be the same (approved) size, and inflated to the prescribed pressure.
- Conventional brake system, including brake light switch and brake lights, OK.
- Hydraulic lines and connections not leaking (visual check of ABS hydraulic unit, brake calipers, tandem master brake cylinder).
- Wheel bearings and wheel bearing play OK.
- ABS control module is correctly bolted to ABS hydraulic unit.
- Harness connector on ABS Control Module (w/EDL) -J104- seated correctly (retainer is engaged).

- Terminals of ABS components checked for damage and correct seating.
- All fuses OK and check to wiring diagram (remove fuse from fuse holder to check).

NOTE: Also, check fuses and fuse connections for corrosion. If corrosion is present

- Supply voltage at least 10.0 volts.

LIST OF SELECTABLE FUNCTIONS

SELECTABLE FUNCTIONS CHART

No.	Function	Test
00 -	Automatic test sequence	See **AUTOMATIC TEST SEQUENCE**
01 -	Check Control Module Versions	See **VAG1551 SCAN TOOL (ST), CONNECTING AND SELECTING FUNCTION**
02 -	Check DTC Memory	See **CHECK DTC MEMORY (FUNCTION 02)**
03 -	Output Diagnostic Test Mode	See **OUTPUT DIAGNOSTIC TEST MODE (FUNCTION 03)**
04 -	Basic Setting(1)	See **BASIC SETTING (FUNCTION 04)**
05 -	Erase DTC Memory	See **ERASE DTC MEMORY (FUNCTION 05)**
06 -	End Output	See **END OUTPUT (FUNCTION 06)**
07 -	Code Control Module	See **CODE CONTROL MODULE (FUNCTION 07)**
08 -	Read Measuring Value Block	See **READ MEASURING VALUE BLOCK (FUNCTION 08)**
(1) Only required for vehicles with EDL		

VAG1551 SCAN TOOL (ST), CONNECTING AND SELECTING FUNCTION

NOTE:

- **All functions which could previously be performed with V.A.G 1551 can also be performed with the new tester VAS 5051.**
- **ABS function is switched off in the control module during On Board Diagnostic (OBD).**
- **DTC memory can be erased after it is successfully checked and repaired.**

- Connect VAG1551 scan tool with VAG1551/3 adapter cable.

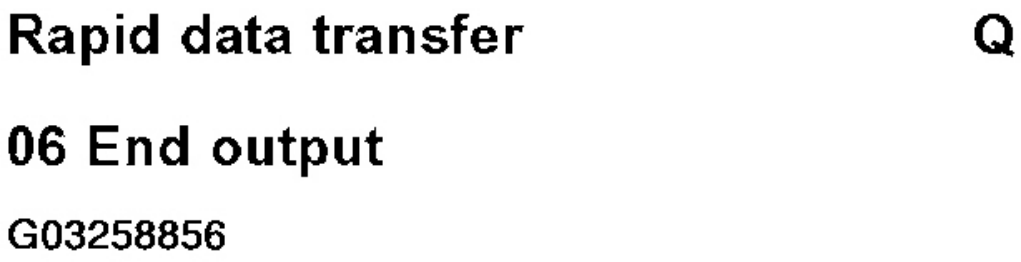


Fig. 12: Connecting VAG1551 Scan Tool With VAG1551/3 Adapter Cable
Courtesy of VOLKSWAGEN OF AMERICA, INC.

NOTE: Only early production cars have the DLC connection at the center console

Connecting VAS 5051, see **VEHICLE DIAGNOSIS, TESTING AND INFORMATION SYSTEM VAS 5051, CONNECTING AND SELECTING ABS CONTROL MODULE** .

Indicated on display

NOTE: Operating modes 1 and 2 are displayed alternately

NOTE:

- **If the display remains blank, check On Board Diagnostic (OBD) harness connector, Electrical testing, see ELECTRICAL TESTING , test steps 14 and 15.**
- **Additional operating instructions can be obtained by pressing the VAG1551 Scan Tool (ST) "HELP" button.**

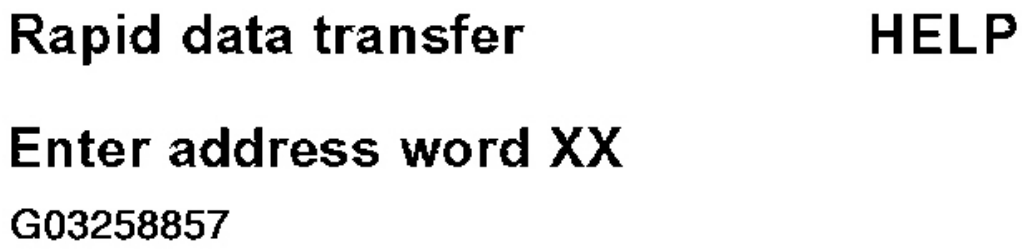


Fig. 13: V.A.G 1551 Scan Tool Display - Initiating On Board Diagnostic (1 Of 12)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- **The --> button is used to advance through the program sequence.**
- **The "PRINT" button is used for switching on the printer (warning lamp in button comes on).**

- Switch ignition on.
- Switch printer on with the "PRINT" button (indicator lamp in button lights up).
- Press button -1- to select "Rapid data transfer" operating mode 1.

Indicated on display

- Press buttons -0- and -3- to insert "Brake Electronics" address word 03.

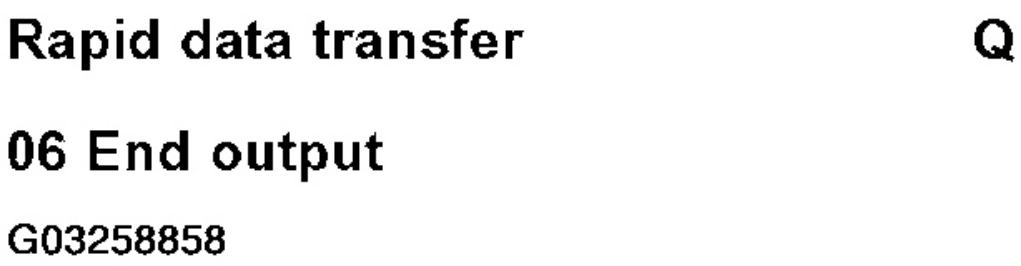


Fig. 14: V.A.G 1551 Scan Tool Display - Initiating On Board Diagnostic (2 Of 12)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

- Press -Q- button to confirm input.

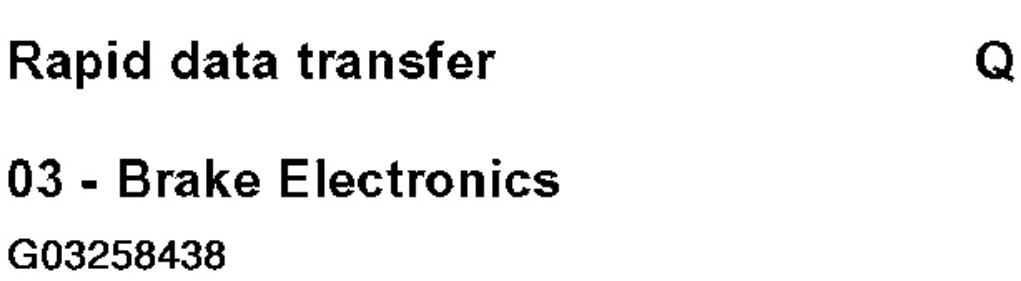


Fig. 15: V.A.G 1551 Scan Tool Display - Initiating On Board Diagnostic (3 Of 12)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

Breakdown of the display

- Control module identification number (e.g. 1J0907379D)
- Control module applications, see parts catalog
- System designation (ABS 20 IE)

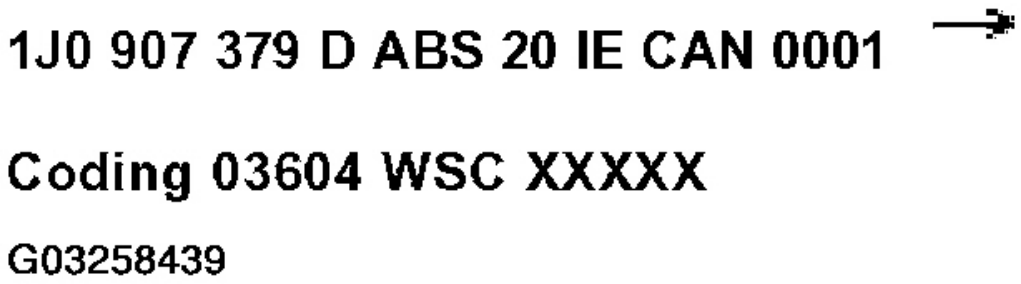


Fig. 16: V.A.G 1551 Scan Tool Display - Initiating On Board Diagnostic (4 Of 12)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- CAN-bus present

  See

- Coding: 03604 (coding control module, see **CODE CONTROL MODULE (FUNCTION 07)**)
- Dealership code, see VAG1551 scan tool operating instructions

If the control module identification number does not appear summary of functions, see **LIST OF SELECTABLE FUNCTIONS** .

- Press --> button.

Indicated on display

NOTE: A list of the possible functions is printed out after pressing the "HELP" button.

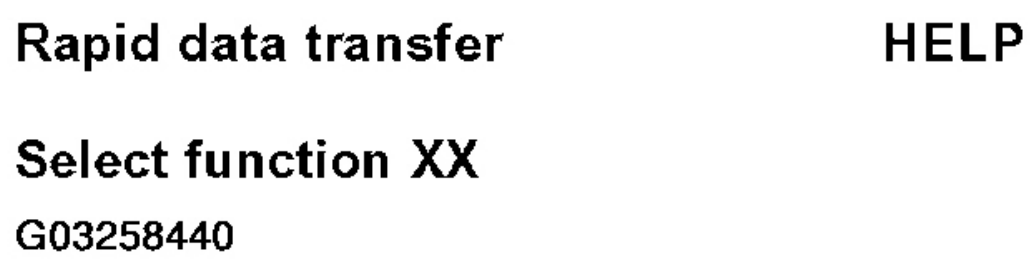


Fig. 17: V.A.G 1551 Scan Tool Display - Initiating On Board Diagnostic (5 Of 12)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display (function selection, e.g. "02 - Check DTC Memory")

NOTE: If the following malfunction information appears in the display, the possible causes of the malfunction can be printed out by pressing the "HELP" button.

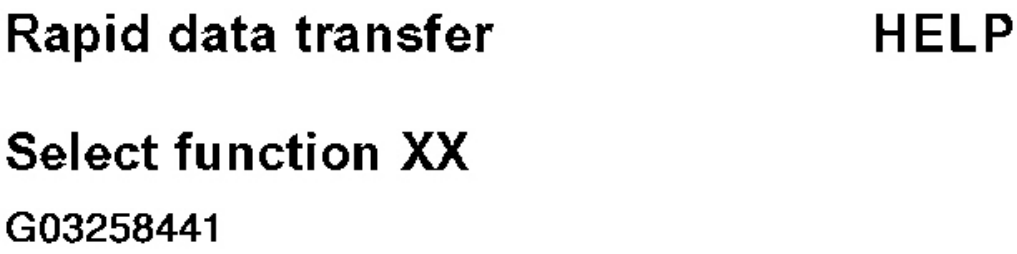


Fig. 18: V.A.G 1551 Scan Tool Display - Initiating On Board Diagnostic (6 Of 12)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

A possible cause of malfunction is the inlet and outlet valves -S9-.

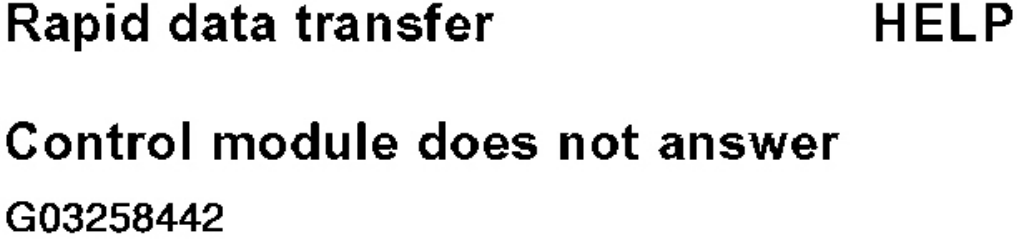


Fig. 19: V.A.G 1551 Scan Tool Display - Initiating On Board Diagnostic (7 Of 12)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Check if ignition switch is in the on position.

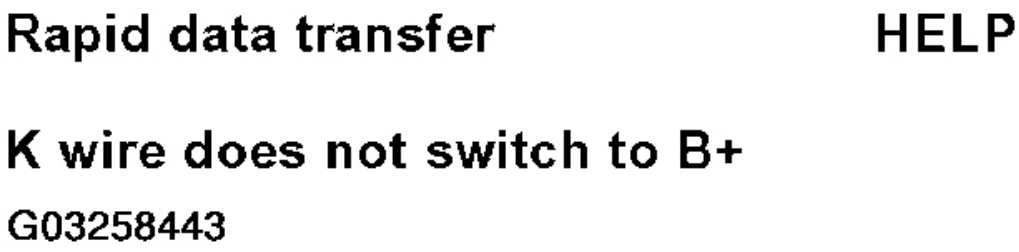


Fig. 20: V.A.G 1551 Scan Tool Display - Initiating On Board Diagnostic (8 Of 12)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Control module identification influenced during checking (possibly influenced from external

- Check DLC connection as well as voltage supply and Ground (GND) connection for ABS Control Module (w/EDL) -J104-, Electrical testing, see **ELECTRICAL TESTING** .
- After repairing the possible causes of the malfunction, again press buttons -0- and -3- to insert "Brake Electronics" address word 03.
- Press -Q- button to confirm input.

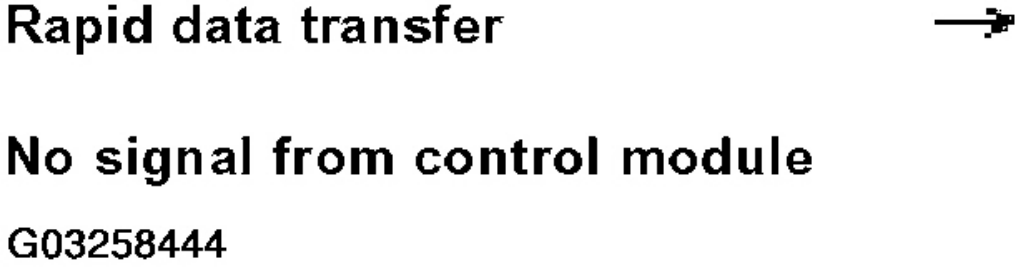


Fig. 21: V.A.G 1551 Scan Tool Display - Initiating On Board Diagnostic (9 Of 12)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

Fig. 22: V.A.G 1551 Scan Tool Display - Initiating On Board Diagnostic (10 Of 12)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

- Press --> button.

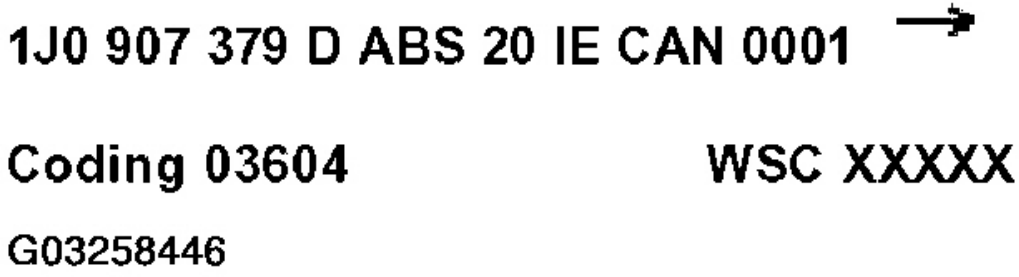


Fig. 23: V.A.G 1551 Scan Tool Display - Initiating On Board Diagnostic (11 Of 12)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

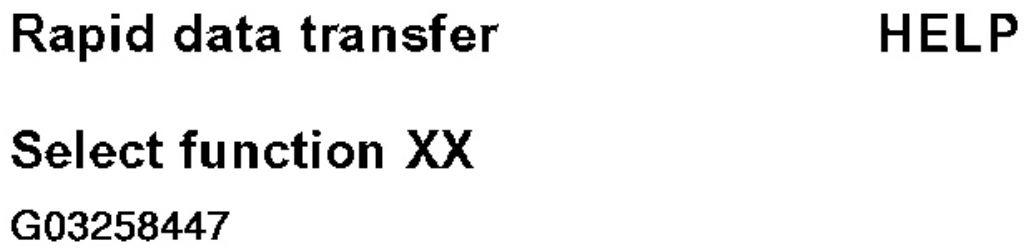


Fig. 24: V.A.G 1551 Scan Tool Display - Initiating On Board Diagnostic (12 Of 12)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

AUTOMATIC TEST SEQUENCE

The automatic test sequence checks the DTC memory of all the control modules.

- Switch ignition on.

Indicated on display (Operating modes 1 and 2 are displayed alternately)

- Press button -1- for "Rapid data transfer" operating mode 1.
- Switch printer on with the "PRINT" button (indicator lamp in button lights up).

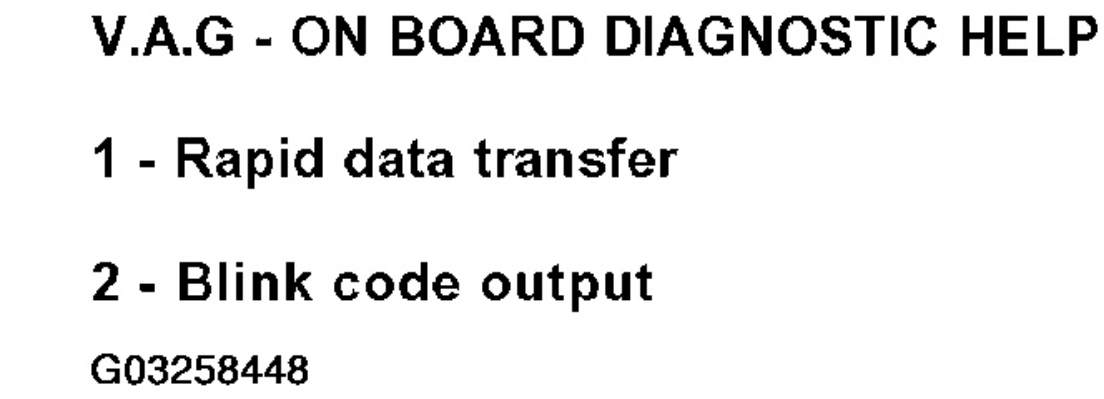


Fig. 25: V.A.G 1551 Scan Tool Display - Automatic Test Sequence (1 Of 3)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

- Press buttons -0- and -0- to insert "Automatic Test Sequence" address word 00.
- Press -Q- button to confirm input.

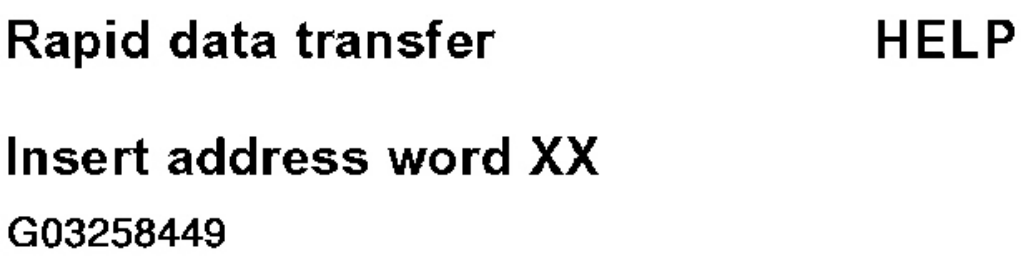


Fig. 26: V.A.G 1551 Scan Tool Display - Automatic Test Sequence (2 Of 3)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display (VAG1551 scan tool display will show the control module identification)

Thereafter, all control module identifications and any stored DTCs are displayed.

Erasing DTC memory is only possible after "Check DTC Memory" (scan tool function 02) is carried out.

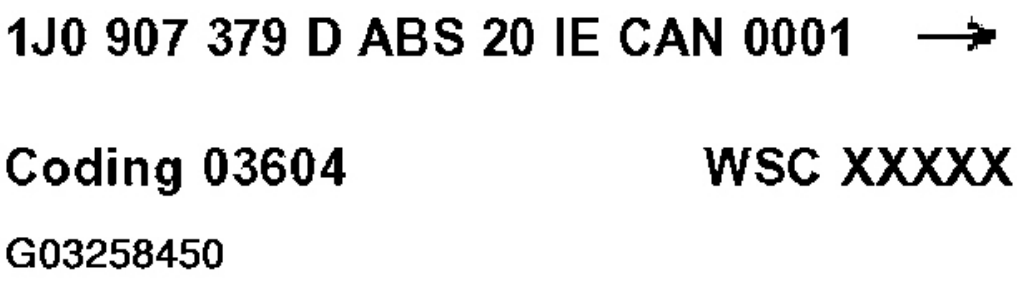


Fig. 27: V.A.G 1551 Scan Tool Display - Automatic Test Sequence (3 Of 3)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

CHECK DTC MEMORY (FUNCTION 02)

All functions which could previously be performed with V.A.G 1551 can also be performed with the new tester VAS 5051.

Indicated on display

- Press buttons -0- and -2- to select "Check DTC Memory" function 02.

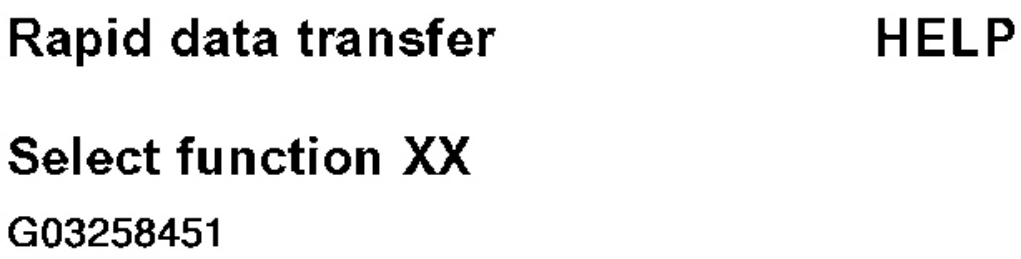


Fig. 28: V.A.G 1551 Scan Tool Display - Checking DTC Memory - Function 02 (1 Of 5)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

- Press -Q- button to confirm input.

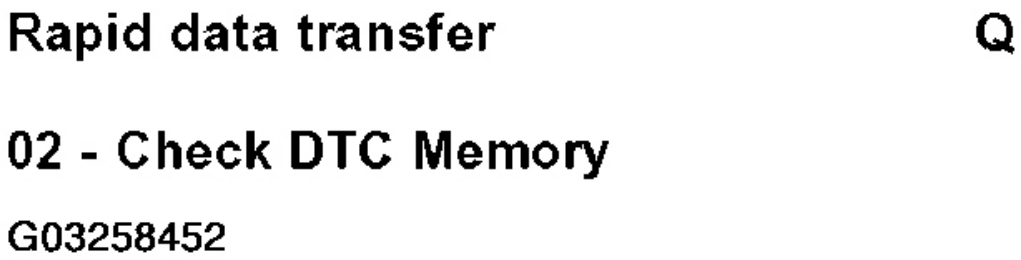


Fig. 29: V.A.G 1551 Scan Tool Display - Checking DTC Memory - Function 02 (2 Of 5)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display (number of stored DTCs, or "No DTC recognized").

Fig. 30: V.A.G 1551 Scan Tool Display - Checking DTC Memory - Function 02 (3 Of 5)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

If the message "No DTC recognized" is displayed, the program can be returned to the starting point by pressing the --> button.

- Press --> button.

  The stored malfunctions are displayed and printed out in sequence.

- Check print-out against DTC table and repair all malfunctions as necessary, see **DIAGNOSTIC TROUBLE CODE (DTC) TABLE** .

  As with "No DTC recognized", the program returns to the start position after pressing the --> key:

Fig. 31: V.A.G 1551 Scan Tool Display - Checking DTC Memory - Function 02 (4 Of 5)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

- End Output (scan tool function 06), see **END OUTPUT (FUNCTION 06)** .

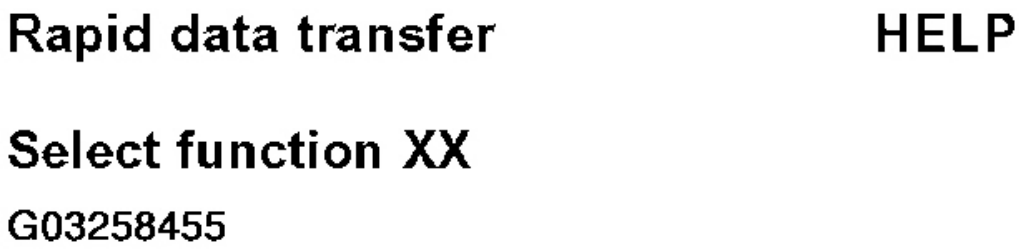


Fig. 32: V.A.G 1551 Scan Tool Display - Checking DTC Memory - Function 02 (5 Of 5)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Switch ignition off.
- Disconnect VAG1551 scan tool from Data Link Connector (DLC).

If a malfunction has been detected:

- Repair malfunction according to DTC table, see **DIAGNOSTIC TROUBLE CODE (DTC) TABLE** .
- Check DTC Memory (scan tool function 02).
- Erase DTC Memory (scan tool function 05).
- End Output (scan tool function 06).
- Road test.
- Check DTC memory again.

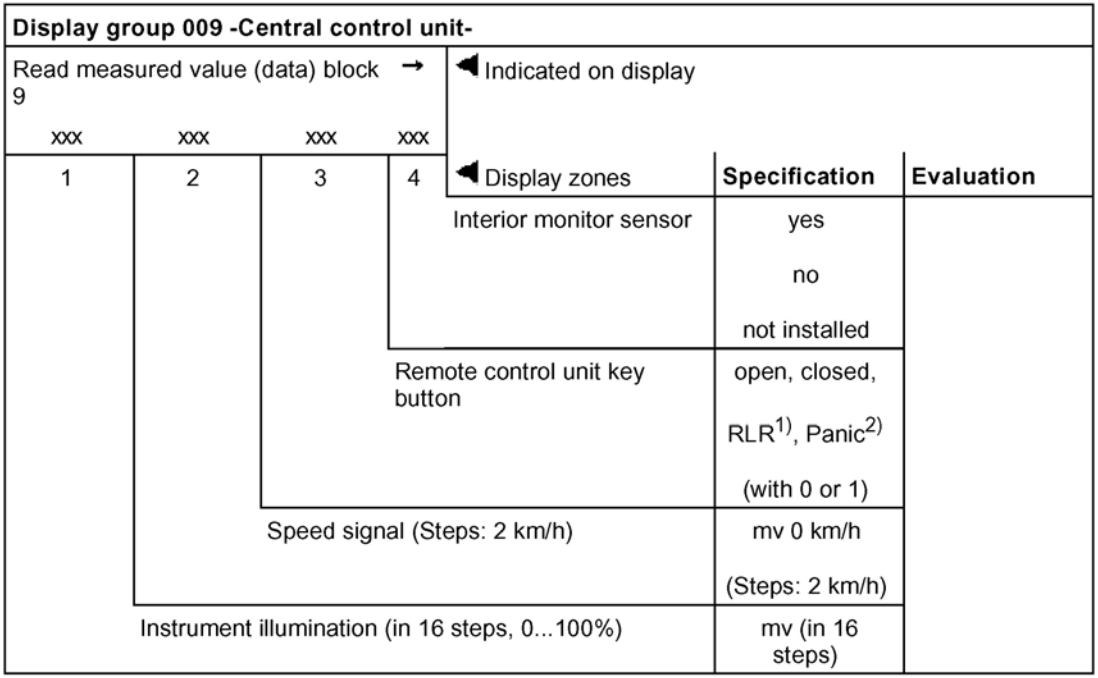
VEHICLE DIAGNOSIS, TESTING AND INFORMATION SYSTEM VAS 5051, CONNECTING AND SELECTING ABS CONTROL MODULE

All functions which could previously be performed with V.A.G 1551 can also be performed with the new tester VAS 5051 in the operating mode "Vehicle On Board Diagnostic".

See .

Special tools and equipment

- VAS 5051 Vehicle Diagnosis, Testing and Information System



Display group 009 -Central control unit-						
Read measured value (data) block → 9				◀ Indicated on display		
xxx	xxx	xxx	xxx			
1	2	3	4	◀ Display zones	**Specification**	**Evaluation**
				Interior monitor sensor	yes no not installed	
				Remote control unit key button	open, closed, RLR[1], Panic[2] (with 0 or 1)	
				Speed signal (Steps: 2 km/h)	mv 0 km/h (Steps: 2 km/h)	
				Instrument illumination (in 16 steps, 0...100%)	mv (in 16 steps)	

[1] RLR= Rear Lid Remote Release

[2] Only vehicles for USA, alarm system and turn signal lights are activated

G03258877

Fig. 33: Identifying VAS 5051 Vehicle Diagnosis, Testing And Information System
Courtesy of VOLKSWAGEN OF AMERICA, INC.

NOTE:

- **The ABS function is switched off in the control module during the On Board Diagnostic.**
- **The DTC memory can be erased after successful checking and repair.**

- With ignition switched off, connect tester VAS 5051 to diagnosis connection using diagnosis cable VAS 5051/1 or VAS 5051/3.

NOTE:

- **In the functions 04 - Basic setting/08 - Read Measured value block, the display zones will be listed from top to bottom.**
- **If the display does not indicate as described in the work sequence, operating instructions for Vehicle Diagnosis, Testing and Information System VAS 5051.**

Indicated on display

Select operating mode:

- Press button on display for "Vehicle On Board Diagnostic" -arrow-.

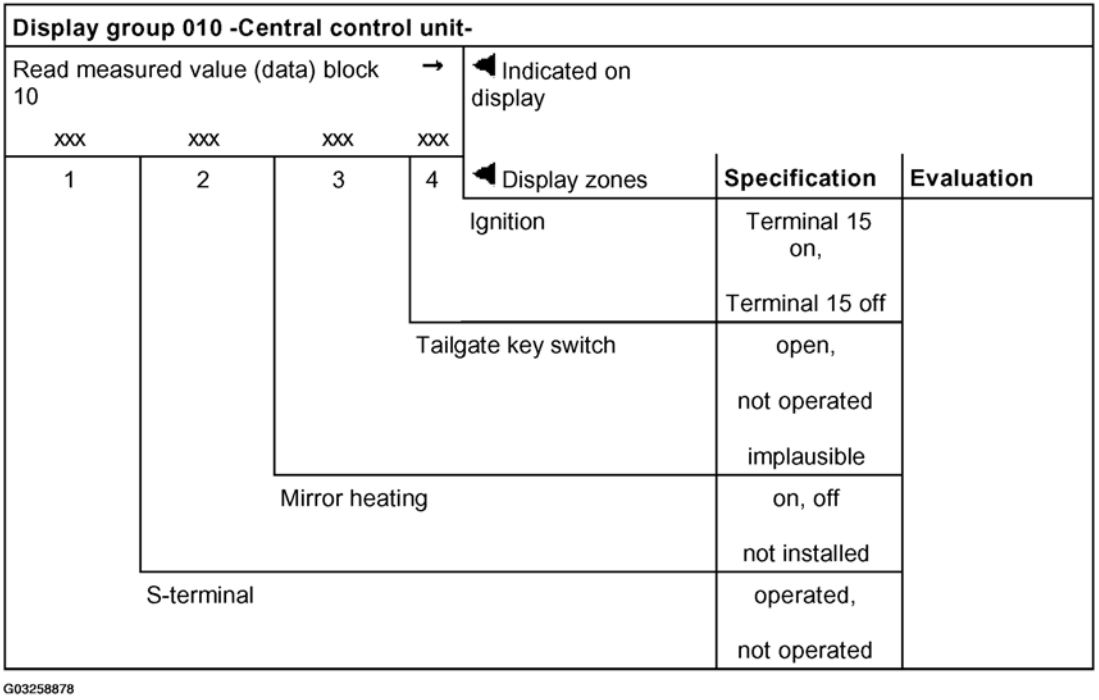


Fig. 34: Pressing Button On Display For "Vehicle On Board Diagnostic"
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

Select vehicle system:

- Press "03 - Brake electronics" on display -arrow-.

Display group 011 -Central control unit-						
Read measured value (data) block 11 →				◀ Indicated on display		
xxx	xxx	xxx	xxx			
1	2	3	4	◀ Display zones	**Specification**	**Evaluation**
				Empty[1)]		
				Sliding/tilting sunroof released[2)]	yes, no	
				Trunk lid/tailgate contact switch	open, closed	
				Hood contact switch	operated, not operated, not installed	

[1)] Empty means in this case: Display zone is blank

[2)] The central control unit transmits a switch-off delayed terminal 15 to the sliding roof control unit. The sliding/tilting roof can then still be operated from the point when the ignition is switched off until one of the front doors is opened.

G03258879

Fig. 35: Pressing "03 - Brake Electronics" On Display
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Displayed is

- The control module identification number.

  e.g. (1J0 907 379 D)

  Application of control module: See Parts catalog

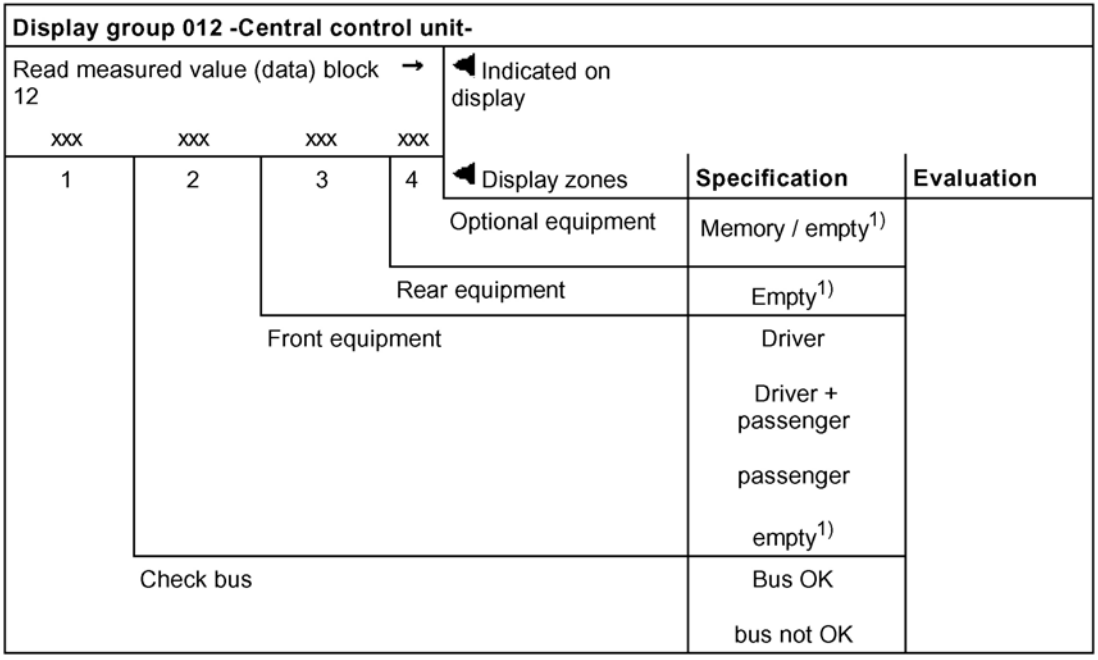


Fig. 36: Displaying Control Module Identification Number
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- System designation (ABS 20 IE)
- Data BUS present. (CAN)
- Control module code (03504).

  Coding control module, see **CODE CONTROL MODULE (FUNCTION 07)** .

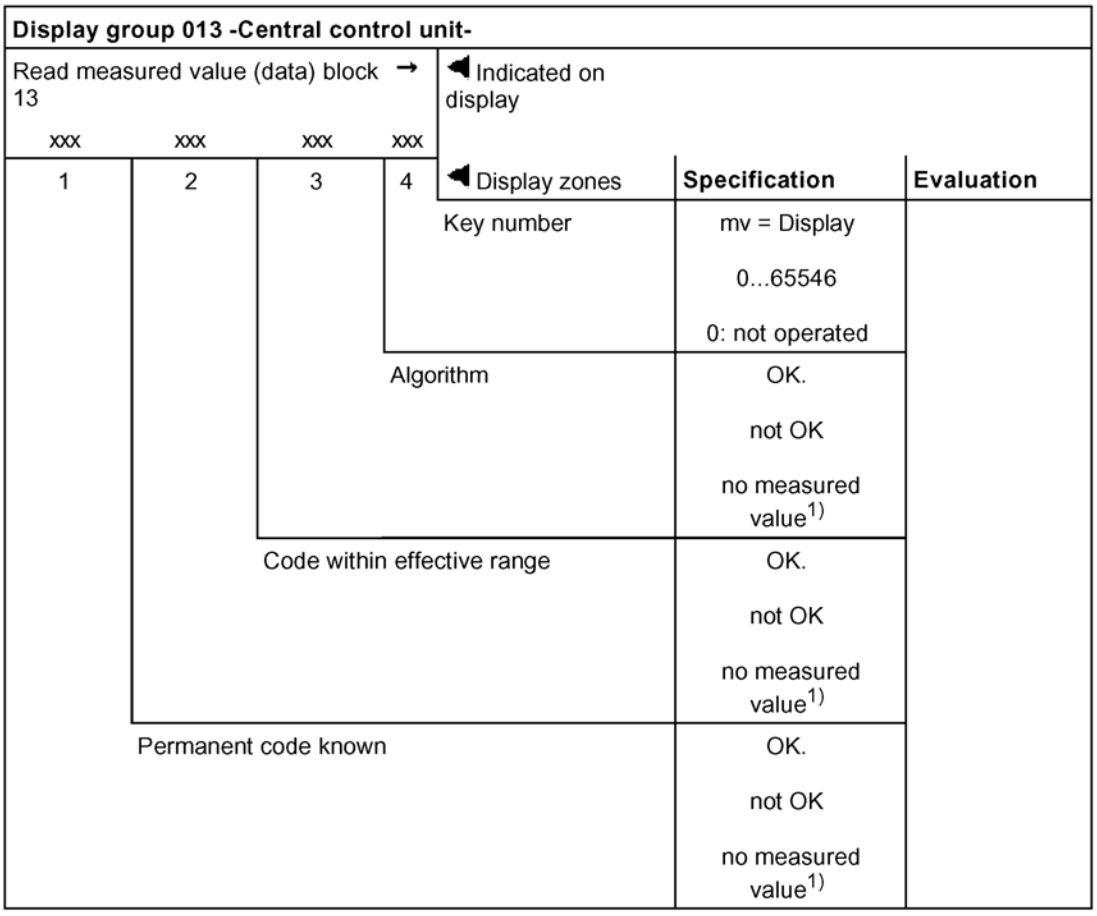
- Workshop code: See operating instructions for Vehicle Diagnosis, Testing and Information System VAS 5051

Indicated on display

Select diagnostic function:

At this point all diagnostic functions are available.

For further measures see repair procedures.



1) If the remote control key is operated several times the third display - no measured value - will change to "OK".

G03258881

Fig. 37: Selecting Diagnostic Function
Courtesy of VOLKSWAGEN OF AMERICA, INC.

DIAGNOSTIC TROUBLE CODE (DTC) TABLE

NOTE:

- **When beginning troubleshooting of the vehicle control modules, always start with "Automatic Test Sequence" address word 00 by pressing buttons -0- and -0-, because the control modules are interconnected with a CAN-bus wire. This checks DTC memory of the control modules in the vehicle.**
- **All the possible malfunctions which can be recognized by ABS control module (w/EDL) -J104- and printed-out on VAG1551 are listed on the following pages according to the 5 digit DTC.**
- **DTC appears (in the "Rapid data transfer" mode) only on the print-out.**

Example:

DTC Malfunction code

5 digit 3 digit

00283 035

- **The 3 digit malfunction code next to the DTC can be disregarded, but the text describing the malfunction type is relevant.**
- **Reference is made to individual "Electrical testing" test steps in the "Corrective action" column.**
- **Before replacing components indicated as being faulty, check all the appropriate harness connectors, wiring and Ground (GND) connections using the wiring diagram.**
- **After carrying out repairs, always check and erase DTC memory with the VAG1551 scan tool. Road test at a speed exceeding 20 km/h (13 mph).**
- **After the road test, check DTC memory again.**

DIAGNOSTIC TROUBLE CODE (DTC) - ITT MARK 20 IE (1 OF 20)

V.A.G 1551 print-out	Possible cause	Corrective action
00283		
Front left speed sensor -G47-	• Open circuit, short to positive or Ground, or loose contact in connections between left front ABS wheel speed sensor -G47- and ABS control module (w/EDL) -J104	• Check wiring and connections using wiring diagram • Perform electrical checks, see **ELECTRICAL TESTING**
	• Damaged rotor or speed sensor -G47 • Speed sensor windings -G47- faulty	• Check left front ABS wheel speed sensor -G47- and rotor for damage • Replace rotor/speed sensor -G47-
		See **ABS SYSTEM COMPONENTS FOR FRONT AXLE, REMOVING AND INSTALLING** ;**ABS SYSTEM COMPONENTS ON REAR AXLE, REMOVING**
		If the malfunction occurs again:
	• ABS control module (w/EDL) -J104- faulty	• Replace ABS control module (w/EDL) -J104-
		See **ABS CONTROL MODULE AND HYDRAULIC UNIT, REMOVING AND INSTALLING** ; **HYDRAULIC UNIT, BRAKE**

		BOOSTER/MASTER CYLINDER - ASSEMBLY OVERVIEW .

DIAGNOSTIC TROUBLE CODE (DTC) - ITT MARK 20 IE (2 OF 20)

V.A.G 1551 print-out	Possible cause	Corrective action
00283		
Front left speed sensor -G47 Signal outside tolerances(1)	• Open circuit, short to positive or Ground, or loose contact in connections between left front ABS wheel speed sensor -G47 and ABS control module (w/EDL) -J104-	• Check wiring and connections using wiring diagram • Perform electrical checks, see **ELECTRICAL TESTING**
	• Electrical interference from other sources (high frequency radiation e.g. non-insulated ignition cable)	• Read measured value block, see **READ MEASURING VALUE BLOCK (FUNCTION 08)** Display group number 001
	• Damaged rotor or speed sensor -G47	
	• Excessive air gap between left front ABS wheel speed sensor -G47- and rotor (signal not OK.)	• Check left front ABS wheel speed sensor -G47- and rotor for damage • Replace rotor/speed sensor
		See **ABS SYSTEM COMPONENTS FOR FRONT AXLE, REMOVING AND INSTALLING** or **ABS SYSTEM COMPONENTS ON REAR AXLE, REMOVING AND INSTALLING** .
(1) Type of DTC, this DTC is only recognized above 20 km/h (13 MPH) (carry out test drive).		

DIAGNOSTIC TROUBLE CODE (DTC) - ITT MARK 20 IE (3 OF 20)

V.A.G 1551 print-out	Possible cause	Corrective action
00283		
Front left speed sensor -G47 Mechanical malfunction(1)	• Excessive air gap between left front ABS wheel speed sensor -G47- and rotor (signal not OK.)	• Check installation of left front ABS wheel speed sensor -G47- and rotor See **ABS SYSTEM COMPONENTS FOR FRONT AXLE, REMOVING AND INSTALLING** or **ABS SYSTEM COMPONENTS ON REAR AXLE, REMOVING AND INSTALLING** . • Read measured value block, see **READ**

		MEASURING VALUE BLOCK (FUNCTION 08) Display group number 002 • Perform output Diagnostic Test Mode (DTM), see **OUTPUT DIAGNOSTIC TEST MODE (FUNCTION 03)**
		If the malfunction occurs again:
	• Outlet valve in ABS hydraulic unit -N55- faulty	• Replace ABS hydraulic unit -N55-
		See **ABS CONTROL MODULE AND HYDRAULIC UNIT, REMOVING AND INSTALLING** ; **HYDRAULIC UNIT, BRAKE BOOSTER/MASTER CYLINDER - ASSEMBLY OVERVIEW** .
(1) Type of DTC, this DTC is only recognized above 20 km/h (13 MPH) (carry out test drive).		

DIAGNOSTIC TROUBLE CODE (DTC) - ITT MARK 20 IE (4 OF 20)

VAG1551 Scan Tool display	Possible cause	Corrective action
00000		
No DTC recognized	If "No DTC recognized" appears after carrying out repairs, On Board Diagnostic (OBD) is ended.	
	If, despite "No DTC recognized" appearing on the display, ABS system does not operate properly, proceed as follows:	
	• Road test at speed exceeding 20 km/h (13 mph).	
	• If there is still no DTC stored, check DTC memory again.	
	• Continue troubleshooting without On Board Diagnostic (OBD) and perform the complete Electrical testing, see **ELECTRICAL TESTING** .	

DIAGNOSTIC TROUBLE CODE (DTC) - ITT MARK 20 IE (5 OF 20)

V.A.G 1551 printout	Possible cause	Corrective action
00285		
Front right speed sensor -G45	• Open circuit, short to positive or Ground, or loose contact in connections between speed sensor -G45- and ABS control module (w/EDL) -J104-	• Check wiring and connections using wiring diagram • Perform electrical checks, see **ELECTRICAL TESTING**
	• Damaged rotor or Right front ABS wheel speed sensor -G45 • Right front ABS wheel speed sensor -G45- faulty	• Check Right front ABS wheel speed sensor -G45- and rotor for damage • Replace rotor/Right front ABS wheel speed sensor -G45-

		See **ABS SYSTEM COMPONENTS FOR FRONT AXLE, REMOVING AND INSTALLING** or **ABS SYSTEM COMPONENTS ON REAR AXLE, REMOVING AND INSTALLING** .
		If the malfunction occurs again:
	• ABS control module (w/EDL) -J104- faulty	• Replace ABS control module (w/EDL) -J104-
		See **ABS CONTROL MODULE AND HYDRAULIC UNIT, REMOVING AND INSTALLING** ; **HYDRAULIC UNIT, BRAKE BOOSTER/MASTER CYLINDER - ASSEMBLY OVERVIEW** .

DIAGNOSTIC TROUBLE CODE (DTC) - ITT MARK 20 IE (6 OF 20)

V.A.G 1551 print-out	Possible cause	Corrective action
00285		
Front right speed sensor -G45 Signal outside tolerances(1)	• Open circuit, short to positive or Ground, or loose contact in connections between Right front ABS wheel speed sensor -G45- and ABS control module (w/EDL) -J104	• Check wiring and connections using wiring diagram • Perform electrical checks, see **ELECTRICAL TESTING**
	• Electrical interference from other sources (high frequency radiation e.g. non-insulated ignition cable)	• Read measured value block, see **READ MEASURING VALUE BLOCK (FUNCTION 08)** Display group number 001
	• Damaged rotor or Right front ABS wheel speed sensor -G45	
	• Excessive air gap between Right front ABS wheel speed sensor -G45- and rotor (signal not OK)	• Check Right front ABS wheel speed sensor -G45- and rotor for damage • Replace rotor/speed sensor
		See **ABS SYSTEM COMPONENTS FOR FRONT AXLE, REMOVING AND INSTALLING** or **ABS SYSTEM COMPONENTS ON REAR AXLE, REMOVING AND INSTALLING** .
(1) Type of DTC, this DTC is only recognized above 20 km/h (13 MPH) (carry out test drive).		

DIAGNOSTIC TROUBLE CODE (DTC) - ITT MARK 20 IE (7 OF 20)

V.A.G 1551 print-out	Possible cause	Corrective action

00285		
Front right speed sensor -G45 Mechanical malfunction(1)	• Excessive air gap between Right front ABS wheel speed sensor -G45- and rotor (signal not OK.)	• Check installation of speed sensor -G45- and rotor See **ABS SYSTEM COMPONENTS FOR FRONT AXLE, REMOVING AND INSTALLING** or **ABS SYSTEM COMPONENTS ON REAR AXLE, REMOVING AND INSTALLING** . • Read measured value block, see **READ MEASURING VALUE BLOCK (FUNCTION 08)** Display group number 002 • Perform output Diagnostic Test Mode (DTM), see **OUTPUT DIAGNOSTIC TEST MODE (FUNCTION 03)**
		If the malfunction occurs again:
	• Outlet valve in ABS hydraulic unit -N55- faulty	• Replace ABS hydraulic unit -N55-
		See **ABS CONTROL MODULE AND HYDRAULIC UNIT, REMOVING AND INSTALLING** ; **HYDRAULIC UNIT, BRAKE BOOSTER/MASTER CYLINDER - ASSEMBLY OVERVIEW** .
(1) Type of DTC, this DTC is only recognized above 20 km/h (13 MPH) (carry out test drive).		

DIAGNOSTIC TROUBLE CODE (DTC) - ITT MARK 20 IE (8 OF 20)

V.A.G 1551 print-out	Possible cause	Corrective action
00287		
Rear right speed sensor -G44-	• Open circuit, short to positive or Ground, or loose contact in connections between right rear ABS wheel speed sensor -G44- and ABS control module (w/EDL) -J104-	• Check wiring and connections using wiring diagram • Perform electrical checks, see **ELECTRICAL TESTING**
	• Damaged rotor or right rear ABS wheel speed sensor -G44- • Right rear ABS wheel speed sensor windings -G44- faulty	• Check right rear ABS wheel speed sensor -G44- and rotor for damage • Replace rotor/right rear ABS wheel speed sensor -G44-
		See **ABS SYSTEM COMPONENTS FOR FRONT AXLE, REMOVING AND**

		INSTALLING or **ABS SYSTEM COMPONENTS ON REAR AXLE, REMOVING AND INSTALLING** .
		If the malfunction occurs again:
	• ABS control module (w/EDL) -J104- faulty	• Replace ABS control module (w/EDL) -J104-
		See **ABS CONTROL MODULE AND HYDRAULIC UNIT, REMOVING AND INSTALLING** ; **HYDRAULIC UNIT, BRAKE BOOSTER/MASTER CYLINDER - ASSEMBLY OVERVIEW** .

DIAGNOSTIC TROUBLE CODE (DTC) - ITT MARK 20 IE (9 OF 20)

V.A.G 1551 print-out	Possible cause	Corrective action
00287		
Rear right speed sensor -G44 Signal outside tolerances(1)	• Open circuit, short to positive or Ground, or loose contact in connections between right rear ABS wheel speed sensor -G44- and ABS control module (w/EDL) -J104-	• Check wiring and connections using wiring diagram • Perform electrical checks, see **ELECTRICAL TESTING**
	• Electrical interference from other sources (high frequency radiation e.g. non-insulated ignition cable)	• Read measured value block, see **READ MEASURING VALUE BLOCK (FUNCTION 08)** Display group number 001
	• Damaged rotor or right rear ABS wheel speed sensor -G44-	
	• Excessive air gap between right rear ABS wheel speed sensor -G44- and rotor (signal not OK.)	• Check right rear ABS wheel speed sensor -G44- and rotor for damage • Replace rotor/speed sensor
		See **ABS SYSTEM COMPONENTS FOR FRONT AXLE, REMOVING AND INSTALLING** or **ABS SYSTEM COMPONENTS ON REAR AXLE, REMOVING AND INSTALLING** .
(1) Type of DTC, this DTC is only recognized above 20 km/h (13 MPH) (carry out test drive).		

DIAGNOSTIC TROUBLE CODE (DTC) - ITT MARK 20 IE (10 OF 20)

V.A.G 1551 print-out	Possible cause	Corrective action
00287		

Rear right speed sensor -G44 Mechanical malfunction(1)	• Excessive air gap between right rear ABS wheel speed sensor -G44- and rotor (signal not OK.)	• Check installation of speed sensor -G44- and rotor See **ABS SYSTEM COMPONENTS FOR FRONT AXLE, REMOVING AND INSTALLING** or **ABS SYSTEM COMPONENTS ON REAR AXLE, REMOVING AND INSTALLING** . • Read measured value block, see **READ MEASURING VALUE BLOCK (FUNCTION 08)** Display group number 002 • Perform output Diagnostic Test Mode (DTM), see **OUTPUT DIAGNOSTIC TEST MODE (FUNCTION 03)**
		If the malfunction occurs again:
	• Outlet valve in ABS hydraulic unit -N55- faulty	• Replace ABS hydraulic unit -N55-
		See **ABS CONTROL MODULE AND HYDRAULIC UNIT, REMOVING AND INSTALLING** ; **HYDRAULIC UNIT, BRAKE BOOSTER/MASTER CYLINDER - ASSEMBLY OVERVIEW** .
(1) Type of DTC, this DTC is only recognized above 20 km/h (13 MPH) (carry out test drive).		

DIAGNOSTIC TROUBLE CODE (DTC) - ITT MARK 20 IE (11 OF 20)

V.A.G 1551 print-out	**Possible cause**	**Corrective action**
00290		
Rear left speed sensor -G46-(1) Fault in electrical circuit	• Open circuit, short to positive or Ground, or loose contact in connections between speed sensor -G46- and ABS control module (w/EDL) -J104-	• Check wiring and connections using wiring diagram • Perform electrical checks, see **ELECTRICAL TESTING**
	• Left rear ABS wheel speed sensor windings -G46- faulty • Damaged rotor or left rear ABS wheel speed sensor -G46	• Check left rear ABS wheel speed sensor -G46- and rotor for damage • Replace rotor/left rear ABS wheel speed sensor -G46
		See **ABS SYSTEM COMPONENTS FOR FRONT AXLE, REMOVING AND INSTALLING** or **ABS SYSTEM**

		COMPONENTS ON REAR AXLE, REMOVING AND INSTALLING .
		If the malfunction occurs again:
	• ABS control module (w/EDL) -J104- faulty	• Replace ABS control module (w/EDL) -J104-
		See **ABS CONTROL MODULE AND HYDRAULIC UNIT, REMOVING AND INSTALLING** ; **HYDRAULIC UNIT, BRAKE BOOSTER/MASTER CYLINDER - ASSEMBLY OVERVIEW** .
(1) This fault is recognized when vehicle is stationary.		

DIAGNOSTIC TROUBLE CODE (DTC) - ITT MARK 20 IE (12 OF 20)

V.A.G 1551 print-out	Possible cause	Corrective action
00290		
Rear left speed sensor -G46 Signal outside tolerances(1)	• Open circuit, short to positive or Ground, or loose contact in connections between left rear ABS wheel speed sensor -G46- and ABS control module (w/EDL) -J104-	• Check wiring and connections using wiring diagram • Perform electrical checks, see **ELECTRICAL TESTING**
	• Electrical interference from other sources (high frequency radiation e.g. non-insulated ignition cable)	• Read measured value block, see **READ MEASURING VALUE BLOCK (FUNCTION 08)** Display group number 001
	• Damaged rotor or left rear ABS wheel speed sensor -G46-	
	• Excessive air gap between left rear ABS wheel speed sensor -G46- and rotor (signal not OK.)	• Check left rear ABS wheel speed sensor -G46- and rotor for damage • Replace rotor/speed sensor
		See **ABS SYSTEM COMPONENTS FOR FRONT AXLE, REMOVING AND INSTALLING** or **ABS SYSTEM COMPONENTS ON REAR AXLE, REMOVING AND INSTALLING** .
(1) Type of DTC; this DTC is only recognized above 20 km/h (13 MPH) (carry out test drive).		

DIAGNOSTIC TROUBLE CODE (DTC) - ITT MARK 20 IE (13 OF 20)

V.A.G 1551 print-out	Possible cause	Corrective action
00290		

Rear left speed sensor -G46 Mechanical malfunction(1)	• Excessive air gap between left rear ABS wheel speed sensor -G46- and rotor (signal not OK.)	• Check installation of left rear ABS wheel speed sensor -G46- and rotor See **ABS SYSTEM COMPONENTS FOR FRONT AXLE, REMOVING AND INSTALLING** or **ABS SYSTEM COMPONENTS ON REAR AXLE, REMOVING AND INSTALLING** . • Read measured value block, see **READ MEASURING VALUE BLOCK (FUNCTION 08)** Display group number 002 • Perform output Diagnostic Test Mode (DTM), see **OUTPUT DIAGNOSTIC TEST MODE (FUNCTION 03)**
		If the malfunction occurs again:
	• Outlet valve in ABS hydraulic unit -N55- faulty	• Replace ABS hydraulic unit -N55-
		See **ABS CONTROL MODULE AND HYDRAULIC UNIT, REMOVING AND INSTALLING** ; **HYDRAULIC UNIT, BRAKE BOOSTER/MASTER CYLINDER - ASSEMBLY OVERVIEW** .
(1) Type of DTC; this DTC is only recognized above 20 km/h (13 MPH) (carry out test drive).		

DIAGNOSTIC TROUBLE CODE (DTC) - ITT MARK 20 IE (14 OF 20)

V.A.G 1551 printout	Possible cause	Corrective action
00668		
Battery Positive Voltage (B+) Term.30 Signal outside tolerances	• Malfunctioning voltage supply wires, connections, fuses -S178- and -S179-	• Check fuses, wires, connections as well as the voltage supply to control module. • Check wiring in wiring harness test step no. 2, see **BRAKE LIGHT SWITCH, ADJUSTING** , Electrical testing. For MY 1998: • Check Ground No. 45 per wiring diagram.
01044		
Control Module incorrectly coded	• Incorrect code number was entered using VAG1551 scan	• Check control module coding, see **CODE CONTROL MODULE**

	tool • Open or short circuit in wiring harness connector from terminal 3 to terminal 14.	**(FUNCTION 07)** . • Check wiring in wiring harness test step no. 13, see **BRAKE LIGHT SWITCH, ADJUSTING** , Electrical testing.

DIAGNOSTIC TROUBLE CODE (DTC) - ITT MARK 20 IE (15 OF 20)

V.A.G 1551 print-out	Possible cause	Corrective action
01130		
ABS operation Implausible signal(1)	• Electrical interference from other sources (high frequency radiation e.g. non-insulated ignition cable)	• Erase DTC memory • Perform test drive at more than 20 km/h (13 MPH) • Check DTC memory again
	• Open circuit, short to positive or Ground in the wiring	• Check wiring and connections using wiring diagram
		• Perform electrical checks, see **ELECTRICAL TESTING**
		If the malfunction occurs again:
	• ABS control module (w/EDL) -J104- faulty	• Replace ABS control module (w/EDL) -J104-
		See **ABS CONTROL MODULE AND HYDRAULIC UNIT, REMOVING AND INSTALLING** ; **HYDRAULIC UNIT, BRAKE BOOSTER/MASTER CYLINDER - ASSEMBLY OVERVIEW** .
(1) Type of DTC; this DTC is only recognized above 20 km/h (13 MPH) (carry out test drive).		

DIAGNOSTIC TROUBLE CODE (DTC) - ITT MARK 20 IE (16 OF 20)

V.A.G 1551 print-out	Possible cause	Corrective action
01276		
ABS hydraulic pump -V64 Signal outside tolerances (1)	• ABS Hydraulic pump -V64- connector to control module faulty	• Perform output Diagnostic Test Mode (DTM), see **OUTPUT DIAGNOSTIC TEST MODE (FUNCTION 03)**
	• Open circuit, short to positive or Ground	• Check wiring and connections using wiring diagram

	in the wiring	
		• Perform electrical checks, see **ELECTRICAL TESTING**
	• Hydraulic pump -V64- faulty	• If the ABS hydraulic pump -V64- runs free while electrical check test step 18 performed, see **BRAKE LIGHT SWITCH, ADJUSTING** , replace ABS control module (w/EDL) -J104-
	• ABS control module (w/EDL)-J104- faulty	• Replace ABS control module (w/EDL) -J104-
		See **ABS CONTROL MODULE AND HYDRAULIC UNIT, REMOVING AND INSTALLING** ; **HYDRAULIC UNIT, BRAKE BOOSTER/MASTER CYLINDER - ASSEMBLY OVERVIEW** .
(1) Type of DTC; this DTC is only recognized above 20 km/h (13 MPH) (carry out test drive).		

DIAGNOSTIC TROUBLE CODE (DTC) - ITT MARK 20 IE (17 OF 20)

V.A.G 1551 printout	Possible cause	Corrective action
01312		
Drive train data bus faulty(1) or:	• ABS control module (w/EDL) -J104- incorrectly coded • Engine control module incorrectly coded	• Check control module (w/EDL) -J104- coding, see **CODE CONTROL MODULE (FUNCTION 07)** • Check engine control module coding See
	• Open circuit, short to positive or Ground in the wiring	• Check wiring and connections using wiring diagram
		• Perform electrical checks, see **ELECTRICAL TESTING**
Drive train data bus faulty1) Sporadic	• Ignition/starter switch turned too slowly	• Erase DTC memory, see **ERASE DTC MEMORY (FUNCTION 05)** • No further measures required • Inform customer
(1) The DTC "Drive train data bus" will not cause the ABS warning light -K47- or warning light for brake system -K118- to light up. The ABS function is retained over the complete range.		

DIAGNOSTIC TROUBLE CODE (DTC) - ITT MARK 20 IE (18 OF 20)

V.A.G 1551 print-		

out	Possible cause	Corrective action
01314		
Engine control module No communication		• Read measured value block, see **READ MEASURING VALUE BLOCK (FUNCTION 08)** display group number 125
	• Open circuit, short to positive or Ground in data bus wiring	• Check wiring and connections of data bus wiring using wiring diagram
		• Perform electrical checks, see **ELECTRICAL TESTING**
01315		
Transmission Control Module (TCM)(1) No communication		• Read measured value block, see **READ MEASURING VALUE BLOCK (FUNCTION 08)** display group number 125
	• Open circuit, short to positive or Ground in data bus wiring	• Check wiring and connections of data bus wiring using wiring diagram
		• Perform electrical checks, see **ELECTRICAL TESTING**
(1) Vehicles with automatic transmission only.		

DIAGNOSTIC TROUBLE CODE (DTC) - ITT MARK 20 IE (19 OF 20)

V.A.G 1551 printout	Possible cause	Corrective action
01316		
Brake control module No communication	• Open circuit, short circuit to positive or Ground in data bus wiring	• Check data bus wiring and connection using wiring diagram
		• Perform electrical checks, see **ELECTRICAL TESTING**

DIAGNOSTIC TROUBLE CODE (DTC) - ITT MARK 20 IE (20 OF 20)

V.A.G 1551 printout	Possible cause	Corrective action
18256		
Check Engine Control Module (ECM) memory	• DTC in ECM	• Check engine control module DTC memory See for relevant engine code
65535		
Control module	ABS control	• Replace control module (w/EDL) -J104-

faulty	module (w/EDL) - J104- faulty	
		See **ABS CONTROL MODULE AND HYDRAULIC UNIT, REMOVING AND INSTALLING** ; **HYDRAULIC UNIT, BRAKE BOOSTER/MASTER CYLINDER - ASSEMBLY OVERVIEW** .

ERASE DTC MEMORY (FUNCTION 05)

NOTE: All functions which could previously be performed with V.A.G 1551 can also be performed with the tester VAS 5051.

Requirements

- DTC memory has been checked
- Press --> button.

Indicated on display

- Press buttons -0- and -5- to select "Erase DTC Memory" function 05.

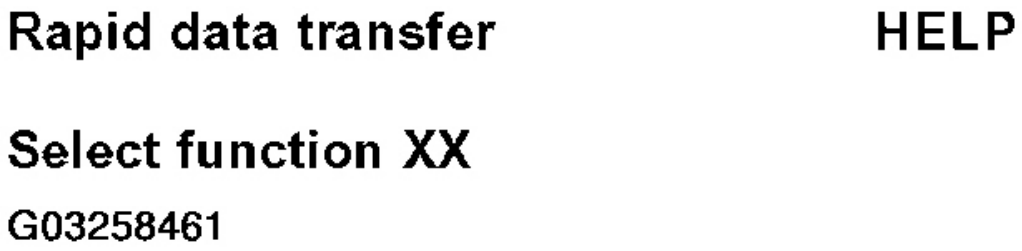


Fig. 38: V.A.G 1551 Scan Tool Display - Erasing DTC Memory - Function 05 (1 Of 6)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

- Press -Q- button to confirm input.

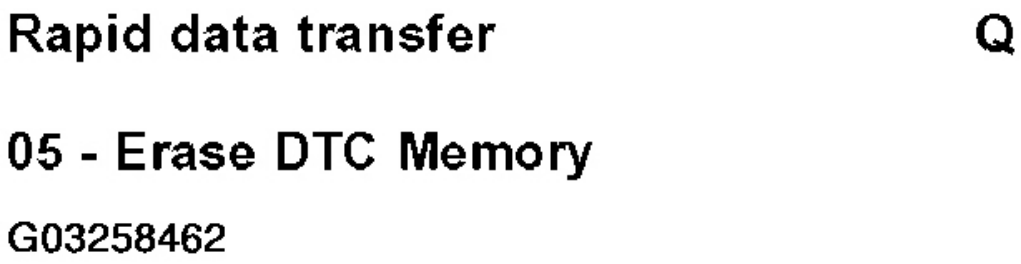


Fig. 39: V.A.G 1551 Scan Tool Display - Erasing DTC Memory - Function 05 (2 Of 6)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

DTC memory is now erased.

- Press --> button.

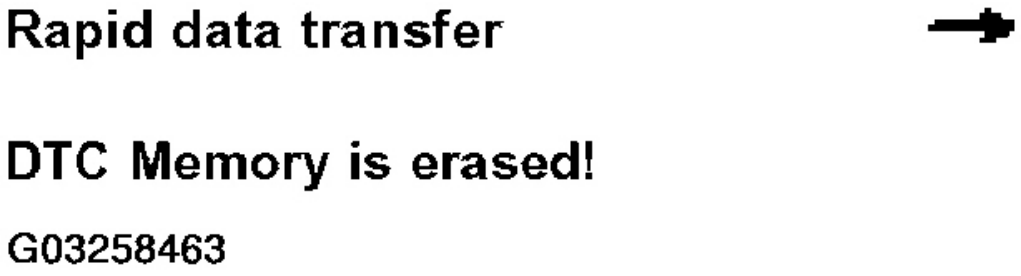


Fig. 40: V.A.G 1551 Scan Tool Display - Erasing DTC Memory - Function 05 (3 Of 6)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

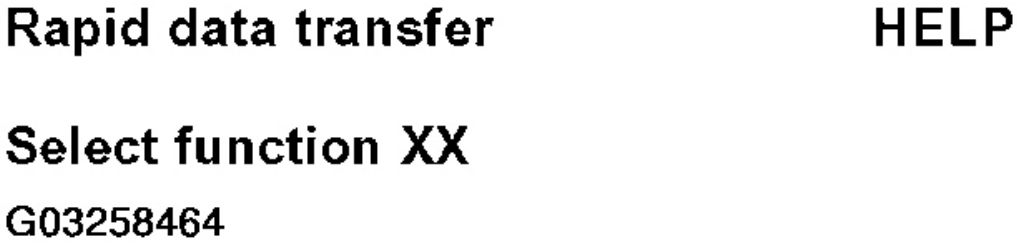


Fig. 41: V.A.G 1551 Scan Tool Display - Erasing DTC Memory - Function 05 (4 Of 6)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

NOTE:

- **This message indicates an error in the test sequence.**

Fig. 42: V.A.G 1551 Scan Tool Display - Erasing DTC Memory - Function 05 (5 Of 6)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- **This message indicates an error in the test sequence.**
- **Adhere exactly to the test sequence: first check DTC memory, and if necessary, repair malfunctions, then erase DTC memory.**

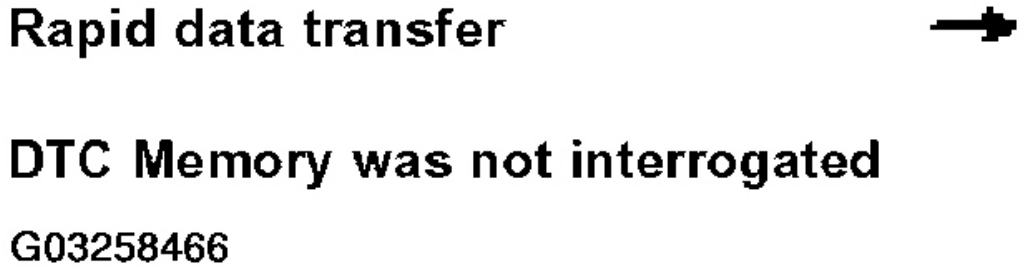


Fig. 43: V.A.G 1551 Scan Tool Display - Erasing DTC Memory - Function 05 (6 Of 6)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

END OUTPUT (FUNCTION 06)

Indicated on display

- Press buttons -0- and -6- to select "End Output" function 06.

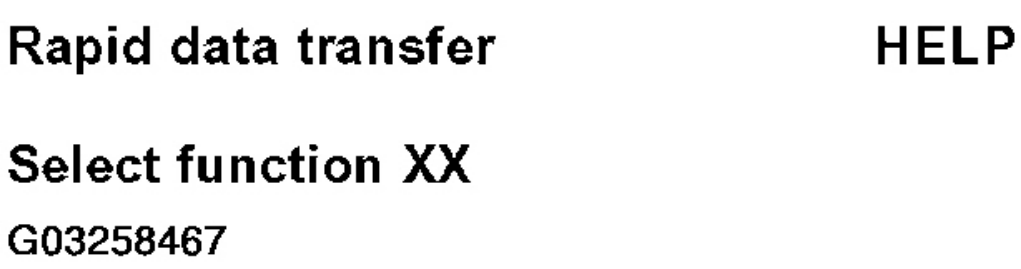


Fig. 44: V.A.G 1551 Scan Tool Display - End Output - Function 06 (1 Of 3)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

- Press -Q- button to confirm input.

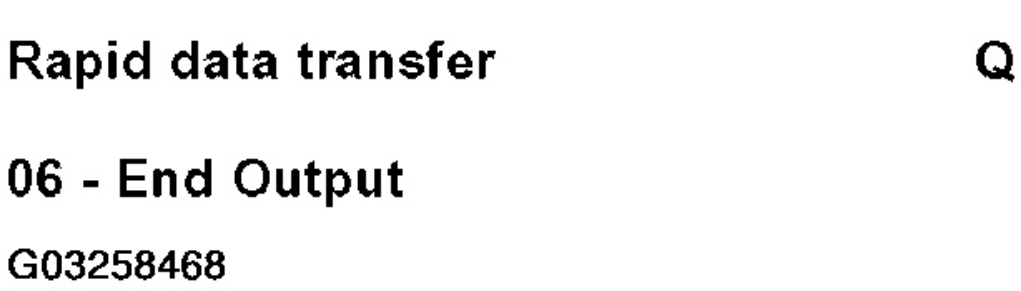


Fig. 45: V.A.G 1551 Scan Tool Display - End Output - Function 06 (2 Of 3)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

- Switch ignition off.
- Disconnect VAG1551 scan tool from Data Link Connector (DLC).
- Switch ignition on.

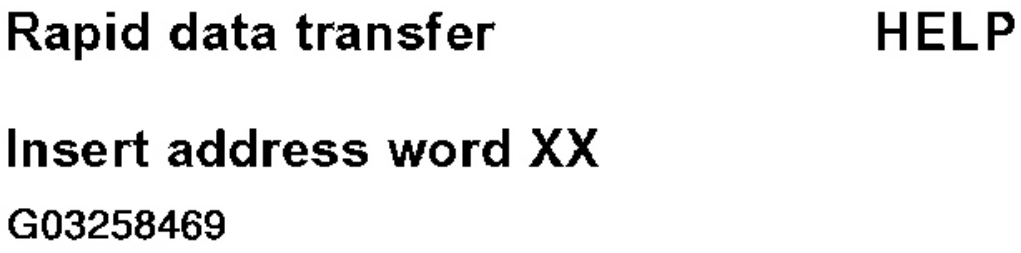


Fig. 46: V.A.G 1551 Scan Tool Display - End Output - Function 06 (3 Of 3)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

ABS warning light -K47- and warning light for brake system -K118- must go out after approx. 2 seconds.

CODE CONTROL MODULE (FUNCTION 07)

- All functions which could previously be performed with V.A.G 1551 can also be performed with the tester VAS 5051.
- ABS warning light -K47- and warning light for brake system -K118- flash when control module is coded

with 00000. An entry is not set in the DTC memory.

- The control module (w/EDL) -J104- must be recoded if the vehicle relevant coding is not displayed or the control module has been replaced.

The control module in the vehicle is coded. New control modules are not coded and must be coded after installation.

Coding is only possible after the dealership code has been entered into the VAG1551 scan tool.

Test sequence

- Determine engine code and type of ABS hydraulic control module installed in vehicle.
- Connect VAG1551 scan tool and insert "Brake Electronics" address word 03 with ignition switched on **VAG1551 SCAN TOOL (ST), CONNECTING AND SELECTING FUNCTION** .

Indicated on display

- Press buttons -0- and -7- to select "Code Control Module" function 07.

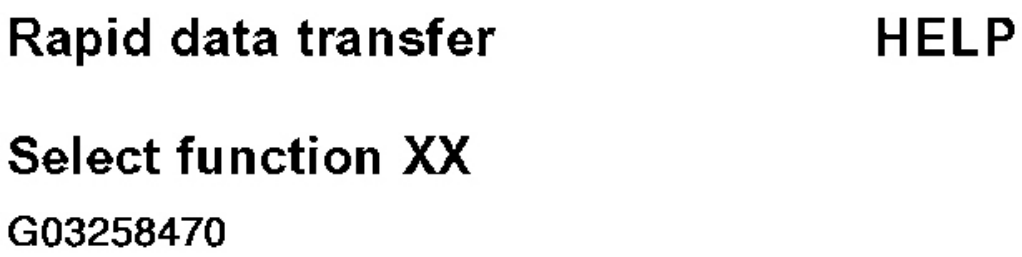


Fig. 47: V.A.G 1551 Scan Tool Display - Code Control Module - Function 07 (1 Of 5)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

- Press -Q- button to confirm input.

Fig. 48: V.A.G 1551 Scan Tool Display - Code Control Module - Function 07 (2 Of 5)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

- Enter relevant code number for vehicle and press -Q- button to confirm input, see VAG1551 Scan Tool (ST) operating instructions.

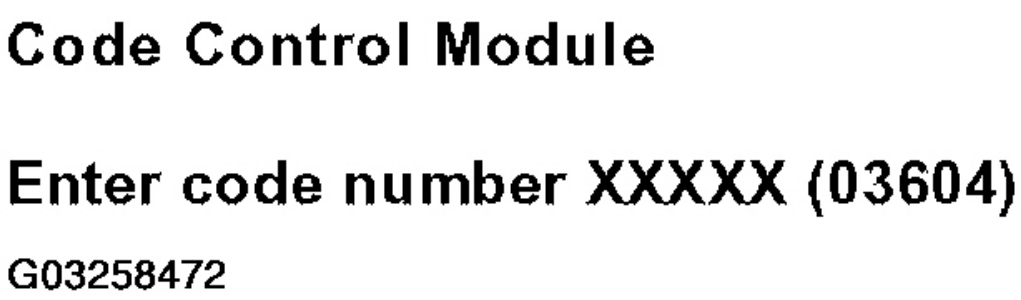


Fig. 49: V.A.G 1551 Scan Tool Display - Code Control Module - Function 07 (3 Of 5)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

The VAG1551 scan tool display will show the control module identification. See **Code table** .

Code table

CONTROL MODULE & ENGINE CODE IDENTIFICATION

Code number	Engine code	Variant
03504	AGU	ABS

13504	AGU	ABS/EDL
03504	AEG	ABS
13504	AEG	ABS/EDL
03504	ALH	ABS
13504	ALH	ABS/EDL
13204	APH	ABS/EDL/ASR

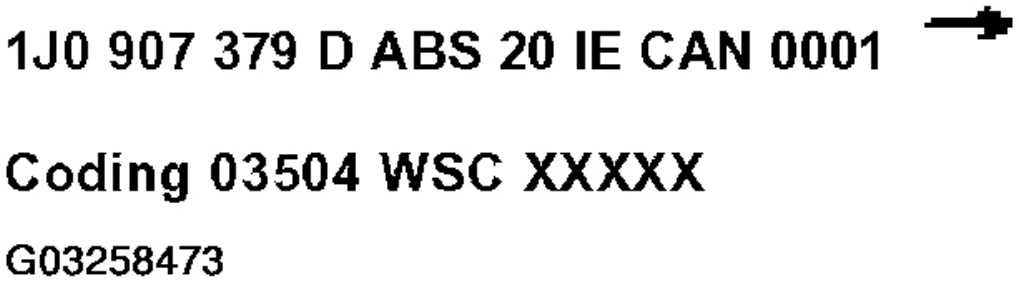


Fig. 50: V.A.G 1551 Scan Tool Display - Code Control Module - Function 07 (4 Of 5)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Press --> button.

Indicated on display

- Press buttons -0- and -6- to select "End Output" function 06.
- Press -Q- button to confirm input.

Fig. 51: V.A.G 1551 Scan Tool Display - Code Control Module - Function 07 (5 Of 5)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

NOTE:

- **If the control module is incorrectly coded ABS warning light -K47- will light up continuously, and warning light for brake system -K118- lights up when 6 mph (approx. 10 km/h) or an engine speed of 2000 rpm has been exceeded once. An entry is made in DTC memory at the same time. Check DTC Memory (scan tool function 02), see CHECK DTC MEMORY (FUNCTION 02) .**
- **If the control module is not coded (code 00000), ABS warning light - K47 - flashes once per second and warning light for brake system - K118- lights up when 6 mph (approx. 10 km/h) or an engine speed of 2000 rpm has been exceeded once.**

READ MEASURING VALUE BLOCK (FUNCTION 08)

NOTE: All functions which could previously be performed with V.A.G 1551 can also be performed with the tester VAS 5051.

The control module can transfer a considerable amount of test data. This test data delivers information on the operational condition of the system and/or sensors connected to it. In many cases the data supplied aids the technician in both troubleshooting and corrective action. Because all the information cannot be evaluated at the same time, the test data has been summarized into single display groups, containing information which can be selected using display group numbers.

- Connect VAG1551 scan tool and insert "Brake Electronics" address word 03 with ignition switched on **VAG1551 SCAN TOOL (ST), CONNECTING AND SELECTING FUNCTION** .

Indicated on display

- Press buttons -0- and -8- to select "Read Measuring Value Block" function 08.

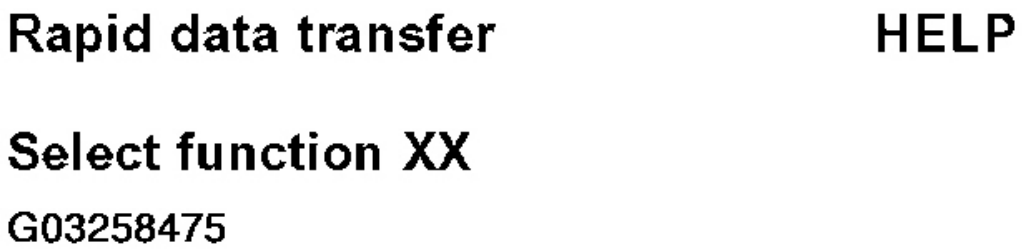


Fig. 52: V.A.G 1551 Scan Tool Display - Read Measuring Value Block - Function 08 (1 Of 3)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

- Press -Q- button to confirm input.

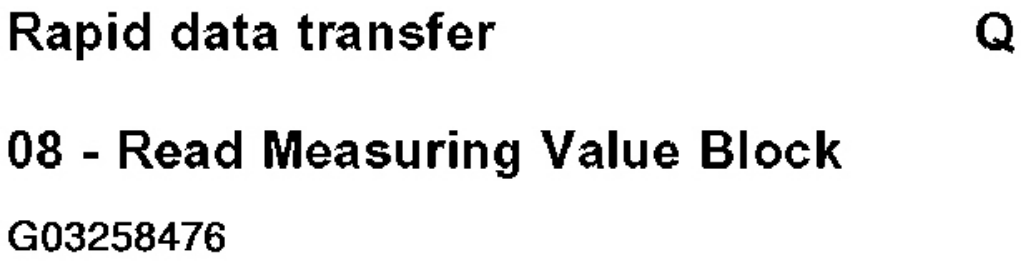


Fig. 53: V.A.G 1551 Scan Tool Display - Read Measuring Value Block - Function 08 (2 Of 3)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

- Input display group number, see list of selectable display group numbers, see **LIST OF SELECTABLE DISPLAY GROUP NUMBERS** .

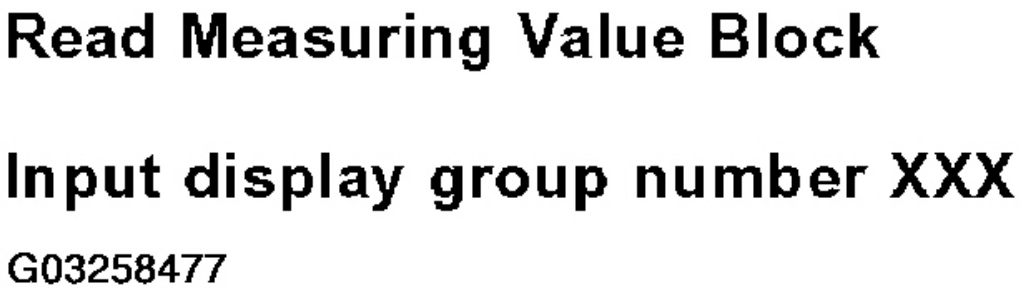


Fig. 54: V.A.G 1551 Scan Tool Display - Read Measuring Value Block - Function 08 (3 Of 3)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

SAFETY PRECAUTIONS

Observe following if test and measuring instruments are required during a test drive:

- Test and measuring instruments must be secured to rear seat and operated by a 2nd person from this location.
- When test and measuring instruments are operated from the front passenger seat there is a danger that the person sitting there could be injured in an accident when the airbag is triggered.

List of selectable display group numbers

SELECTABLE DISPLAY GROUP NUMBERS LIST (1 Of 2)

Display group number	Display field	Designation
001	1	Wheel speed at left-front wheel sensor (km/h)
	2	Wheel speed at right-front wheel sensor (km/h)
	3	Wheel speed at left-rear wheel speed sensor (km/h)
	4	Wheel speed at right-rear wheel speed sensor (km/h)
002	1	Wheel speed at left-front wheel speed sensor (km/h)
	2	Wheel speed at right-front wheel sensor (km/h)
	3	Wheel speed at left-rear wheel speed sensor (km/h)
	4	Wheel speed at right-rear wheel speed sensor (km/h)
003	1	Brake light switch
	2	Vacant
	3	Vacant
	4	Vacant

SELECTABLE DISPLAY GROUP NUMBERS LIST (2 Of 2)

Display group number	Display zone	Designation
006	1	Longitudinal acceleration sensor -G251-(1)
	2	Vacant
	3	Vacant
	4	Vacant
125	1	Data bus for engine
	2	Data bus for all wheel drive(1)
	3	Data bus for transmission(2)
	4	Vacant

(1) All wheel drive vehicles with Haldex coupling only.

(2) Vehicles with automatic transmission only.

Test sequence and test tables with measured values

Checking wheel speed sensor allocation

Display group 001

- Press buttons -0-, -0- and -1 - to input display group number 1 (001).
- Press -Q- button to confirm input.
- There are always 4 display fields (arrows) in the display group. Descriptions of the individual values in display fields 1 - 4 can be found in the table, see **CHECKING WHEEL SPEED SENSOR** .

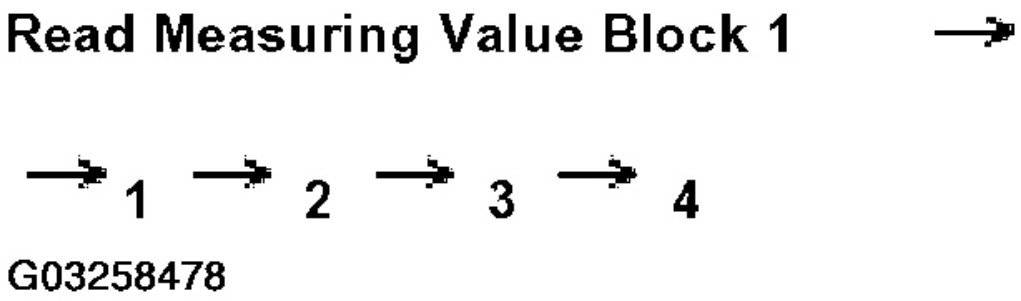


Fig. 55: V.A.G 1551 Scan Tool Display - Checking Wheel Speed Sensor Allocation (1 Of 2)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display (vehicle stationary)

- Press -C- button for next display group number entry.

  If the --> button is pressed, buttons -0- and -8- ("Read Measuring Value Block") must be pressed again to regain entry.

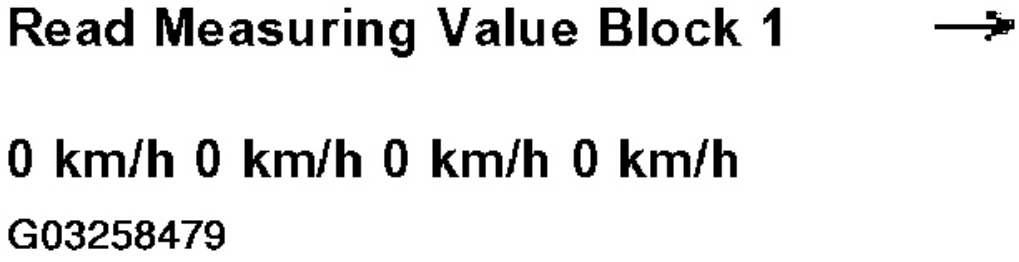


Fig. 56: V.A.G 1551 Scan Tool Display - Checking Wheel Speed Sensor Allocation (2 Of 2)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

MEASURING VALUE BLOCK 1

<table>
<tr><td colspan="3">Read Measuring Value Block 1</td><td>--></td><td>Display group 001</td></tr>
<tr><td>0 km/h</td><td>4 km/h</td><td>0 km/h</td><td>0 km/h</td><td>Indicated on display (Example)</td></tr>
<tr><td></td><td></td><td></td><td></td><td>Wheel speed at right-rear wheel speed sensor
• (0 - 255 km/h)</td></tr>
<tr><td></td><td></td><td></td><td colspan="2">Wheel speed at left-rear wheel speed sensor
• (0 - 255 km/h)</td></tr>
<tr><td></td><td></td><td colspan="3">Wheel speed at right-front wheel speed sensor
• (0 - 255 km/h)</td></tr>
<tr><td></td><td colspan="4">Wheel speed at left-front wheel speed sensor
• (0 - 255 km/h)</td></tr>
<tr><td colspan="5">NOTE:
For display group 001 remember: The momentary wheel speeds are displayed, and are used to verify correct wheel speed sensor connections. (The vehicle must be raised and the wheel must be rotated by hand by a second technician).</td></tr>
</table>

Checking wheel speed sensor

Display group 002

The measured value block for display group 002 must be read when the vehicle is being driven slowly. ABS control module (w/EDL) -J104- saves the first usable voltage signal from the wheel speed sensor and displays this value in the display group. The values are displayed on the VAG1551 when the vehicle is being driven slowly.

- Press buttons -0-, -0- and -2- to input display group number 2 (002).
- Press -Q- button to confirm input.

  There are always 4 display fields (arrows) in the display group. Descriptions of the individual values in display fields 1 - 4 can be found in the table, see **CHECKING ABS BRAKE LIGHT SWITCH AND ABS/EDL FUNCTION**

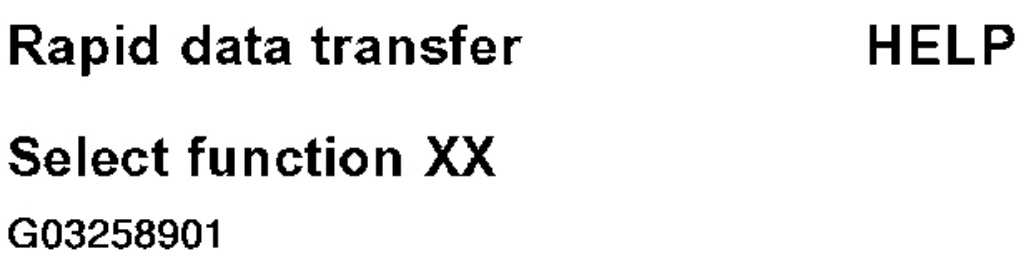


Fig. 57: V.A.G 1551 Scan Tool Display - Checking Wheel Speed Sensor (1 Of 2)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display (vehicle stationary)

- Press -C- button for next display group number entry.

  If the --> button is pressed, buttons -0- and -8- ("Read Measuring Value Block") must be pressed again to regain entry.

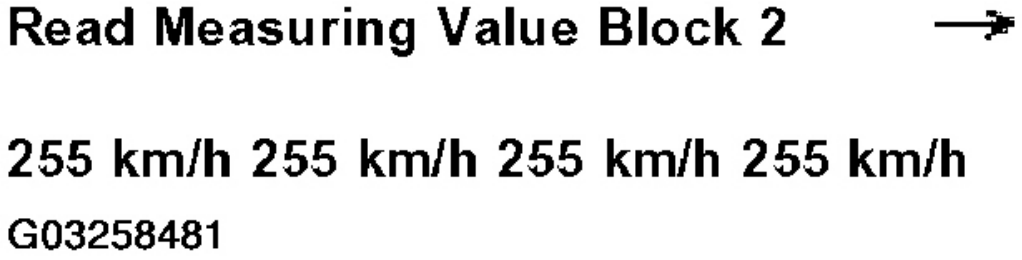


Fig. 58: V.A.G 1551 Scan Tool Display - Checking Wheel Speed Sensor (2 Of 2)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

NOTE: For display group number 002 remember:

- **The reading of measured value blocks in display group number 002 must be undertaken when driving off slowly. Then the ABS control module (w/EDL) -J104- will store the first usable voltage signals provided by the speed sensors and display these as a fixed value in the measured value block.**

MEASURING VALUE BLOCK 2

<table>
<tr><td colspan="3">Read Measuring Value Block 2</td><td>--></td><td>Display group 002</td></tr>
<tr><td>3 km/h(1)</td><td>6 km/h(1)</td><td>2 km/h(1)</td><td>1 km/h(1)</td><td>Indicated on display (when driving slowly)</td></tr>
<tr><td></td><td></td><td></td><td></td><td>Wheel speed at right-rear wheel speed sensor
• (0 - 255 km/h)</td></tr>
<tr><td></td><td></td><td></td><td colspan="2">Wheel speed at left-rear wheel speed sensor
• (0 - 255 km/h)</td></tr>
<tr><td></td><td></td><td colspan="3">Wheel speed at right-front wheel speed sensor
• (0 - 255 km/h)</td></tr>
<tr><td></td><td colspan="4">Wheel speed at left-front wheel speed sensor
• (0 - 255 km/h)</td></tr>
<tr><td colspan="5">(1) If the deviations in display fields 1-4 are greater than 6 km/h (4 mph), the following may be cause of the malfunction. Air gap between wheel speed sensor and rotor may be too large: Check that wheel speed sensor is screwed correctly to wheel bearing housing. Wheel speed sensor or rotor exterior damaged: Change damaged component.</td></tr>
<tr><td colspan="5">NOTE:
For display group 002 remember: Deviations of the displayed values in display fields 1 - 4 must never be greater than 6 km/h (4 mph).</td></tr>
</table>

Checking ABS brake light switch and ABS/EDL function

Display group 003

- Press buttons -0-, -0- and -3- to input display group number 3 (003).
- Press -Q- button to confirm input.
- There are always 4 display fields (arrows) in the display group. Descriptions of the individual values in display fields 1 - 4 can be found in the table, see **OUTPUT DIAGNOSTIC TEST MODE (FUNCTION 03)**

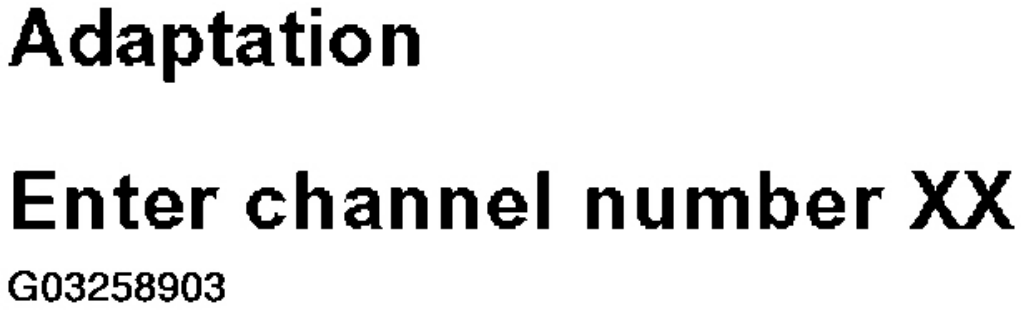


Fig. 59: V.A.G 1551 Scan Tool Display - Checking ABS Brake Light Switch And ABS/EDL Function (1 Of 2)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

- Press -C- button for next display group number entry.

  If the --> button is pressed, buttons -0- and -8- ("Read Measuring Value Block") must be pressed again to regain entry.

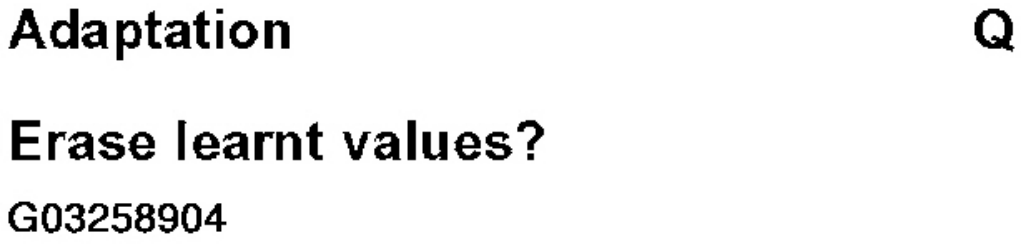


Fig. 60: V.A.G 1551 Scan Tool Display - Checking ABS Brake Light Switch And ABS/EDL Function (2 Of 2)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

MEASURING VALUE BLOCK 3

Read Measuring Value Block 3			-->	**Display group 003**
0				Indicated on display

				Vacant
			Vacant	
		Vacant		
	Brake light switch: • 0 --> Brake pedal not depressed • 1 --> Brake pedal depressed If a -0- is displayed on the VAG1551 display despite a depressed brake pedal, or a -1- is displayed on the VAG1551 display without a depressed brake pedal, perform Electrical testing, test step No. 4 in **VOLTAGE TEST - SWITCH TO 20V DC MEASURING RANGE** . There is also a possibility that the brake light switch has not been correctly adjusted Adjusting brake light switch, see **BRAKE LIGHT SWITCH, ADJUSTING**			

OUTPUT DIAGNOSTIC TEST MODE (FUNCTION 03)

NOTE:

- **All functions which could previously be performed with V.A.G 1551 can also be performed with the tester VAS 5051.**

Output Diagnostic Test Mode (DTM) allows you to check the function of the hydraulic system and the pump motor for incorrect connections or leaks (brake line connections to brake calipers and function of hydraulic valves).

NOTE:

- **The vehicle must be raised until all wheels are free to turn. A second technician is required to rotate wheels.**
- **The -C- button can be used to exit the test sequence at any time.**
- **After depressing the brake pedal several times the vacuum in the brake booster will be exhausted. For this reason, more pressure must be applied to the brake pedal in order to attain the same braking effect.**
- **When the vacuum in the brake booster is exhausted the wheels may not lock. Start the engine briefly to build up vacuum in the brake booster.**

Example of VAG1551 display during output DTM (left-front wheel, FL shown in example):

Indicated on display

IFL: Inlet valve Front Left

VBAT: Battery voltage at valve

OFL: Outlet valve Front Left

0V: 0 Volts (no voltage at valve)

Locked/free: Wheel condition; must be checked by second technician

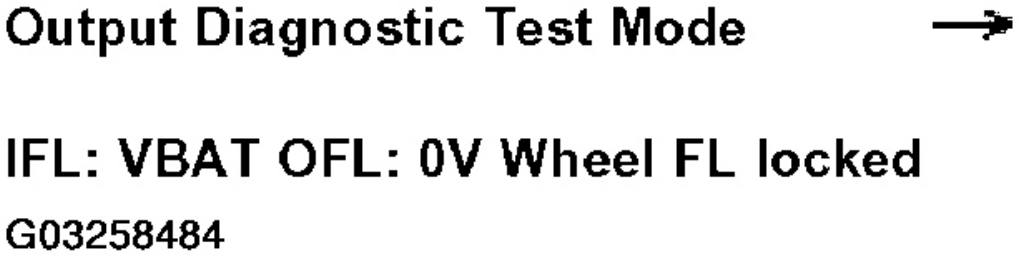


Fig. 61: V.A.G 1551 Scan Tool Display - Initiating Output Diagnostic Test Mode - Function 03 (1 Of 37)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

Hydr-P: Hydraulic pump

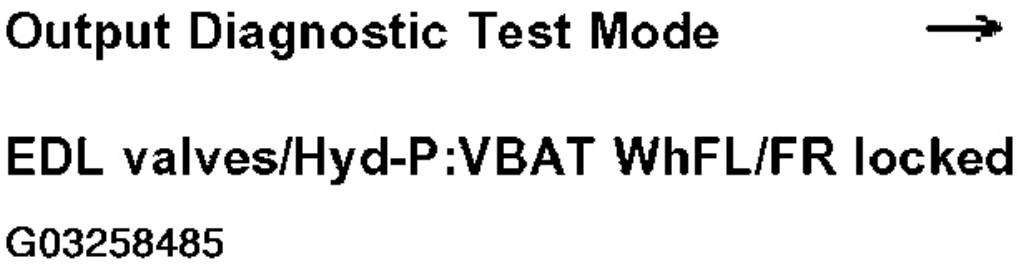


Fig. 62: V.A.G 1551 Scan Tool Display - Initiating Output Diagnostic Test Mode - Function 03 (2 Of 37)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Connect VAG1551 scan tool, see **VAG1551 SCAN TOOL (ST), CONNECTING AND SELECTING FUNCTION**
- Switch ignition on.
- Press button -1 - for "Rapid data transfer" operating mode.
- Press buttons -0- and -3- to insert "Brake Electronics" address word 03, see **VAG1551 SCAN TOOL (ST), CONNECTING AND SELECTING FUNCTION**

Indicated on display

- Press -Q- button to confirm input.

NOTE: During the next procedure steps ABS warning lamp -K47- flashes.

- Read control module version in VAG1551 display.
- Press --> button.

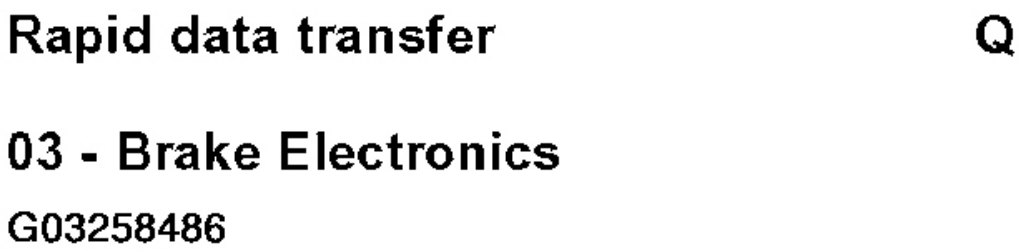


Fig. 63: V.A.G 1551 Scan Tool Display - Initiating Output Diagnostic Test Mode - Function 03 (3 Of 37)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

- Press buttons -0- and -3- to select "Output Diagnostic Test Mode" function 03.

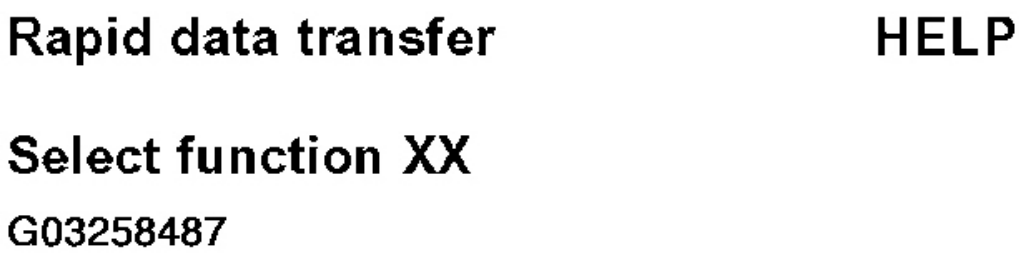


Fig. 64: V.A.G 1551 Scan Tool Display - Initiating Output Diagnostic Test Mode - Function 03 (4 Of 37)

Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

- Press -Q- button to confirm input.

ABS hydraulic pump display group number: must run.

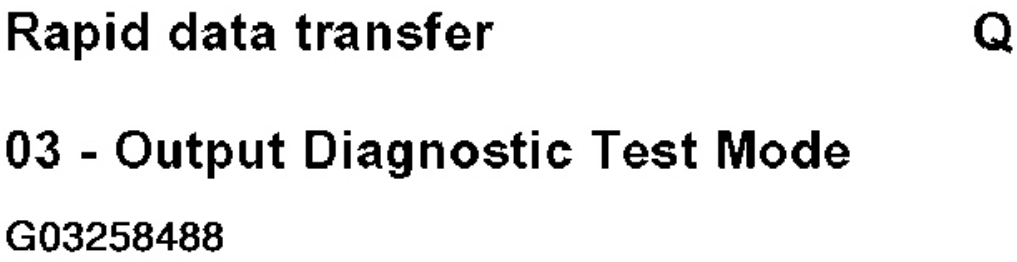


Fig. 65: V.A.G 1551 Scan Tool Display - Initiating Output Diagnostic Test Mode - Function 03 (5 Of 37)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

- Press --> button.

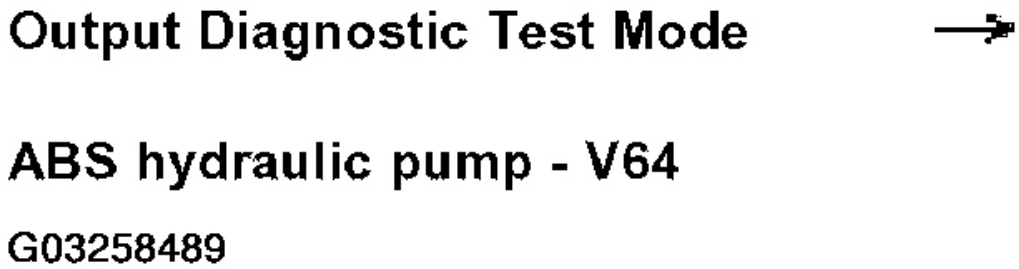


Fig. 66: V.A.G 1551 Scan Tool Display - Initiating Output Diagnostic Test Mode - Function 03 (6 Of 37)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

- Operate brake pedal.
- Press --> button.

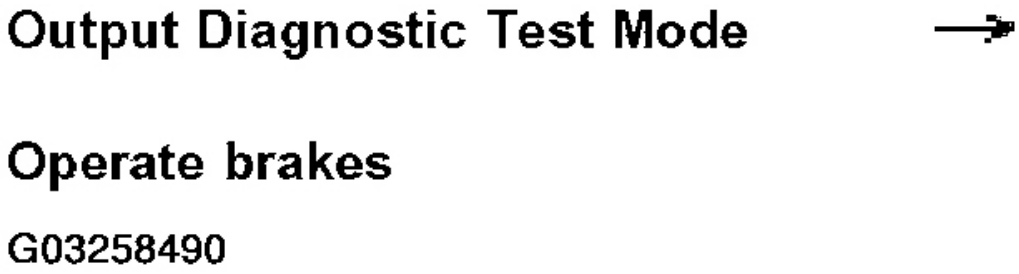


Fig. 67: V.A.G 1551 Scan Tool Display - Initiating Output Diagnostic Test Mode - Function 03 (7 Of 37)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

- Indicate to second technician which wheel requires turning by hand.

If the wheel does not lock, a malfunction may exist in the mechanical and/or hydraulic section of the brake system.

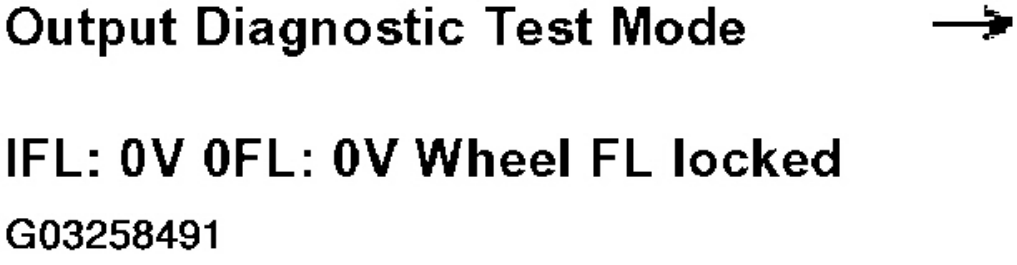


Fig. 68: V.A.G 1551 Scan Tool Display - Initiating Output Diagnostic Test Mode - Function 03 (8 Of 37)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Press --> button.

Indicated on display

- Press --> button.

ABS hydraulic pump display group number: must run.

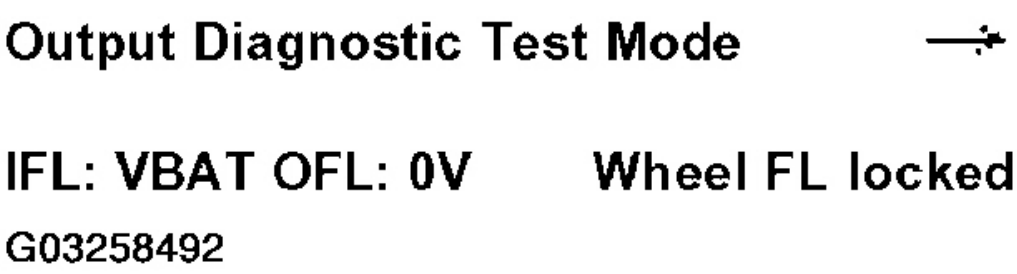


Fig. 69: V.A.G 1551 Scan Tool Display - Initiating Output Diagnostic Test Mode - Function 03 (9 Of 37)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Brake pedal must not give.

If the brake pedal gives, there is a malfunction in the hydraulic unit. In this case the hydraulic unit must be replaced:

See

Indicated on display

- Indicate to second technician which wheel requires turning by hand.

If the wheel locks it is possible that the brake lines to the wheel calipers have been interchanged.

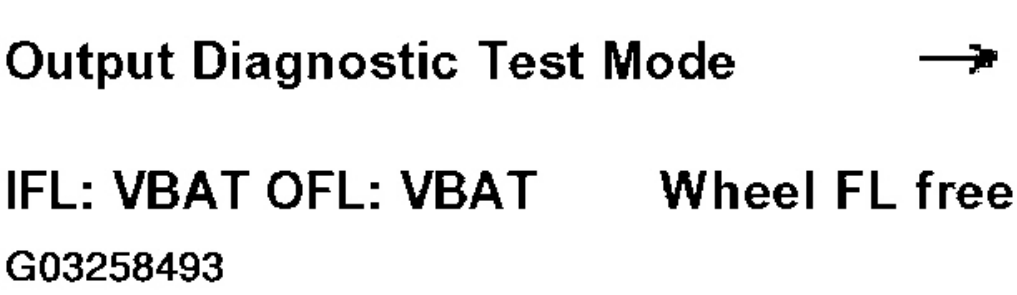


Fig. 70: V.A.G 1551 Scan Tool Display - Initiating Output Diagnostic Test Mode - Function 03 (10 Of 37)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Press --> button.

ABS hydraulic pump display group number: -V64- no longer runs.

Indicated on display

- Press --> button.

Brake pedal must give noticeably.

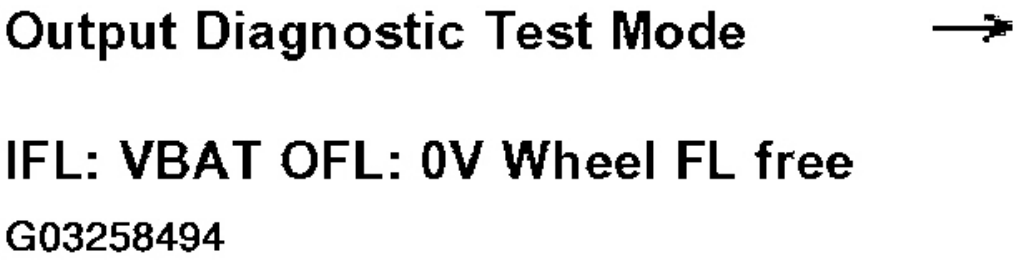


Fig. 71: V.A.G 1551 Scan Tool Display - Initiating Output Diagnostic Test Mode - Function 03 (11 Of 37)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

If the brake pedal does not give, there is a malfunction in the hydraulic unit. In this case the hydraulic unit must be replaced:

See

Indicated on display

- Indicate to second technician which wheel requires turning by hand.

If the wheel does not lock, a malfunction may exist in the mechanical and/or hydraulic section of the brake system.

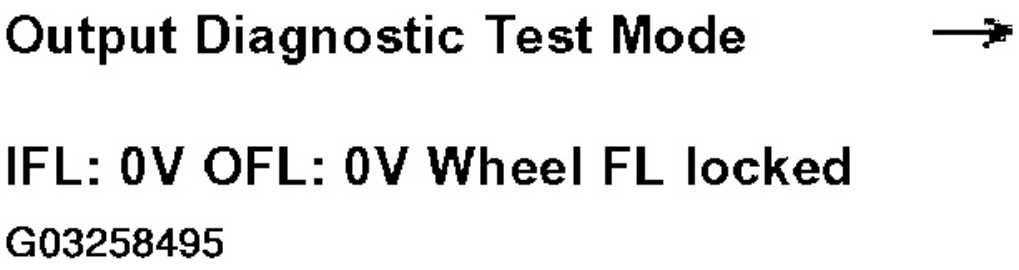


Fig. 72: V.A.G 1551 Scan Tool Display - Initiating Output Diagnostic Test Mode - Function 03 (12 Of 37)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Press --> button.

Indicated on display

- Remove foot from brake pedal.
- Press --> button.

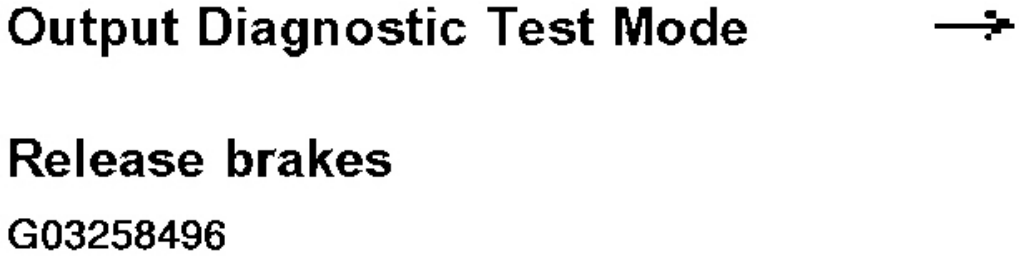


Fig. 73: V.A.G 1551 Scan Tool Display - Initiating Output Diagnostic Test Mode - Function 03 (13 Of 37)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

- Operate brake pedal.
- Press --> button.

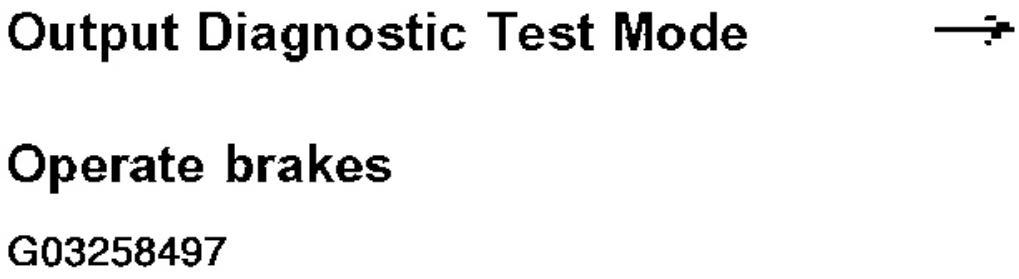


Fig. 74: V.A.G 1551 Scan Tool Display - Initiating Output Diagnostic Test Mode - Function 03 (14 Of 37)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

- Indicate to second technician which wheel requires turning by hand.

If the wheel does not lock, a malfunction may exist in the mechanical and/or hydraulic section of the brake system.

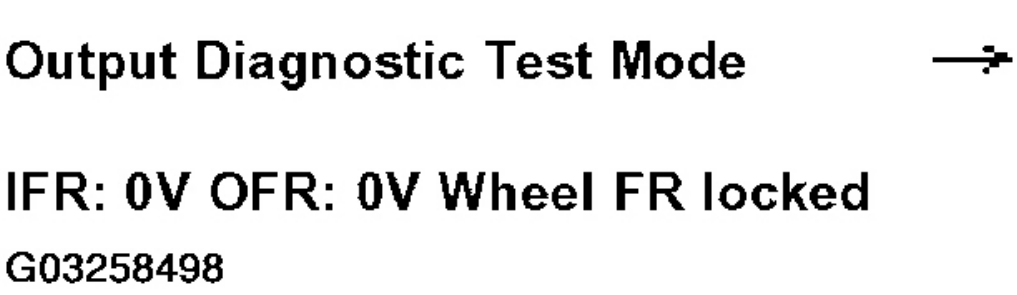


Fig. 75: V.A.G 1551 Scan Tool Display - Initiating Output Diagnostic Test Mode - Function 03 (15 Of 37)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Press --> button.

Indicated on display

- Press --> button.

ABS hydraulic pump display group number: must run.

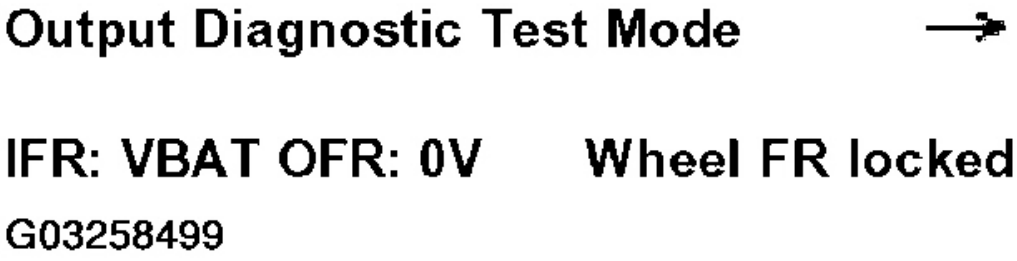


Fig. 76: V.A.G 1551 Scan Tool Display - Initiating Output Diagnostic Test Mode - Function 03 (16 Of 37)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Brake pedal must not give.

If the brake pedal gives, there is a malfunction in the hydraulic unit. In this case the hydraulic unit must be replaced:

See

Indicated on display

- Indicate to second technician which wheel requires turning by hand.

If the wheel locks it is possible that the brake lines to the wheel calipers have been interchanged.

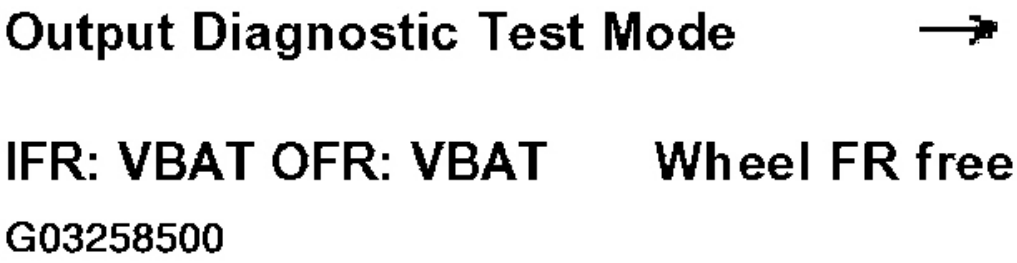


Fig. 77: V.A.G 1551 Scan Tool Display - Initiating Output Diagnostic Test Mode - Function 03 (17 Of 37)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Press --> button.

ABS hydraulic pump display group number: no longer runs.

Indicated on display

- Press --> button.

Brake pedal must give noticeably.

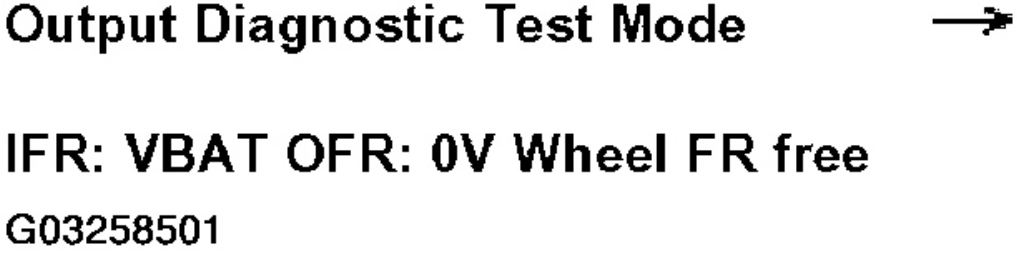


Fig. 78: V.A.G 1551 Scan Tool Display - Initiating Output Diagnostic Test Mode - Function 03 (18 Of 37)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

If the brake pedal does not give, there is a malfunction in the hydraulic unit. In this case the hydraulic unit must be replaced:

See **ABS CONTROL MODULE AND HYDRAULIC UNIT, REMOVING AND INSTALLING** .

Indicated on display

- Indicate to second technician which wheel requires turning by hand.

If the wheel does not lock, a malfunction may exist in the mechanical and/or hydraulic section of the brake system.

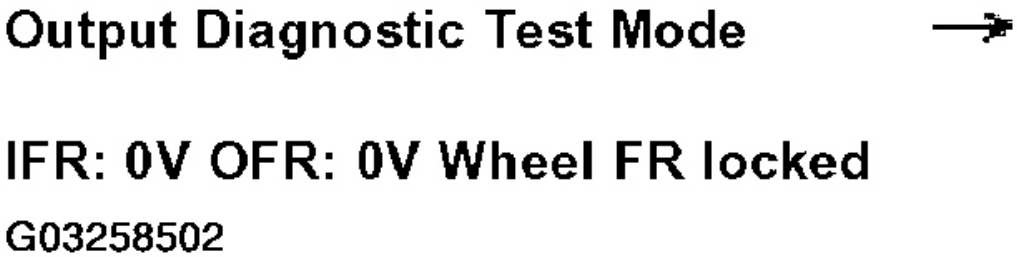


Fig. 79: V.A.G 1551 Scan Tool Display - Initiating Output Diagnostic Test Mode - Function 03 (19 Of 37)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Press --> button.

Indicated on display

- Remove foot from brake pedal.
- Press --> button.

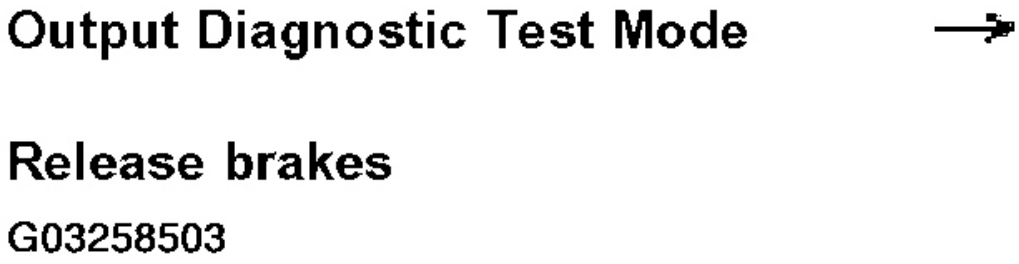


Fig. 80: V.A.G 1551 Scan Tool Display - Initiating Output Diagnostic Test Mode - Function 03 (20 Of 37)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

- Operate brake pedal.
- Press --> button.

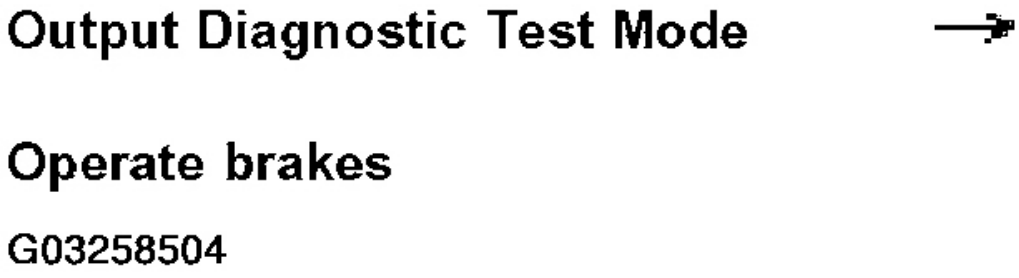


Fig. 81: V.A.G 1551 Scan Tool Display - Initiating Output Diagnostic Test Mode - Function 03 (21 Of 37)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

- Indicate to second technician which wheel requires turning by hand.

If the wheel does not lock, a malfunction may exist in the mechanical and/or hydraulic section of the brake system.

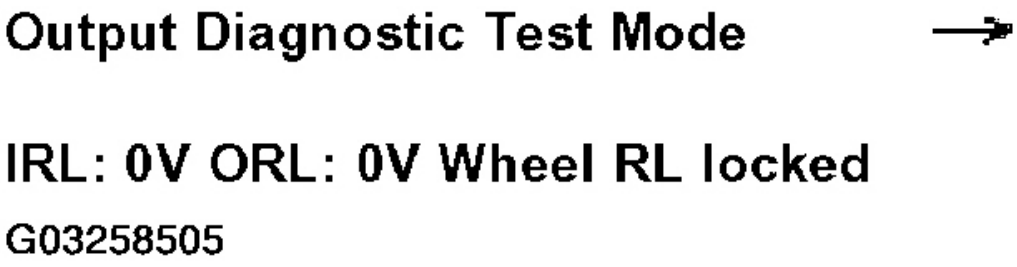


Fig. 82: V.A.G 1551 Scan Tool Display - Initiating Output Diagnostic Test Mode - Function 03 (22 Of 37)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Press --> button.

Indicated on display

- Press --> button.

ABS hydraulic pump display group number: must run.

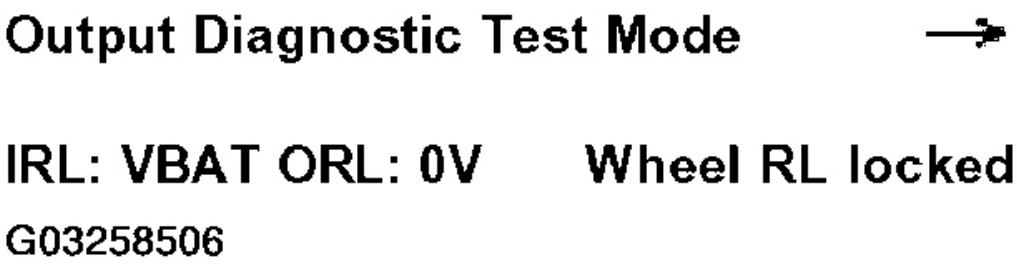


Fig. 83: V.A.G 1551 Scan Tool Display - Initiating Output Diagnostic Test Mode - Function 03 (23 Of 37)

Courtesy of VOLKSWAGEN OF AMERICA, INC.

Brake pedal must not give.

If the brake pedal gives, there is a malfunction in the hydraulic unit. In this case the hydraulic unit must be replaced:

See **ABS CONTROL MODULE AND HYDRAULIC UNIT, REMOVING AND INSTALLING** .

Indicated on display

- Indicate to second technician which wheel requires turning by hand.

If the wheel locks it is possible that the brake lines to the wheel calipers have been interchanged.

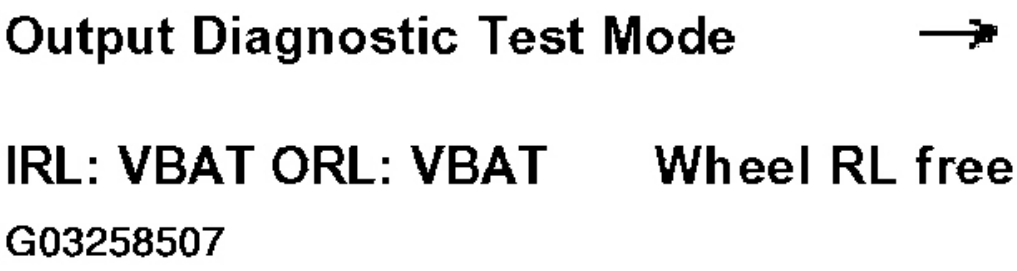


Fig. 84: V.A.G 1551 Scan Tool Display - Initiating Output Diagnostic Test Mode - Function 03 (24 Of 37)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Press --> button.

ABS hydraulic pump display group number: no longer runs.

Indicated on display

- Press --> button.

Brake pedal must give noticeably.

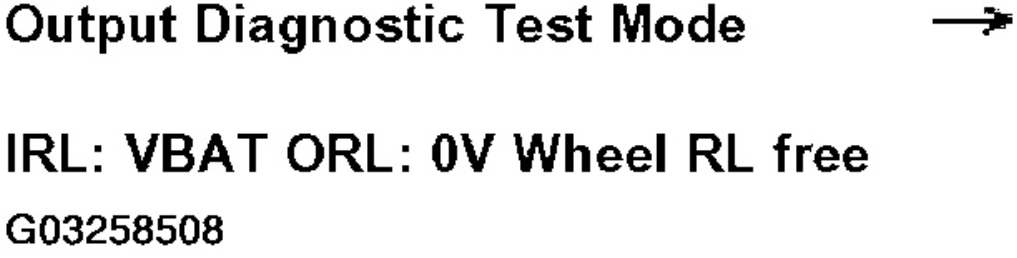


Fig. 85: V.A.G 1551 Scan Tool Display - Initiating Output Diagnostic Test Mode - Function 03 (25 Of 37)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

If the brake pedal does not give, there is a malfunction in the hydraulic unit. In this case the hydraulic unit must be replaced:

See **ABS CONTROL MODULE AND HYDRAULIC UNIT, REMOVING AND INSTALLING** .

Indicated on display

- Indicate to second technician which wheel requires turning by hand.

If the wheel does not lock, a malfunction may exist in the mechanical and/or hydraulic section of the brake system.

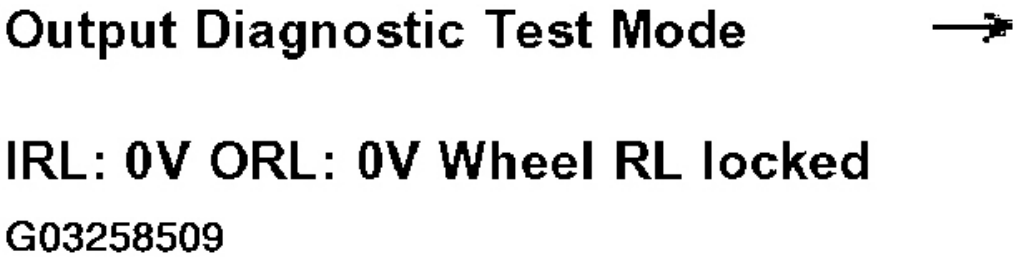


Fig. 86: V.A.G 1551 Scan Tool Display - Initiating Output Diagnostic Test Mode - Function 03 (26 Of 37)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Press --> button.

Indicated on display

- Remove foot from brake pedal.
- Press --> button.

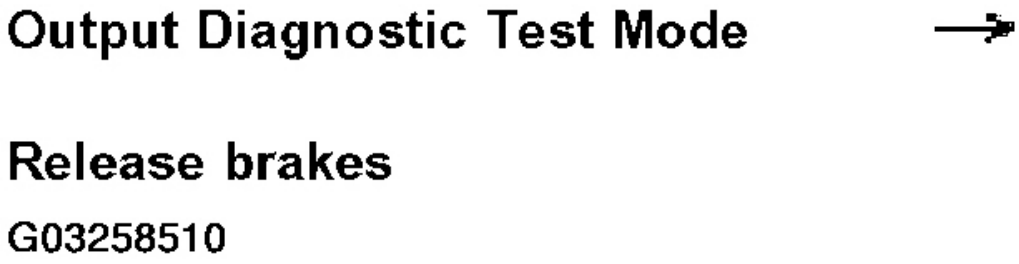


Fig. 87: V.A.G 1551 Scan Tool Display - Initiating Output Diagnostic Test Mode - Function 03 (27 Of 37)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

- Operate brake pedal.
- Press --> button.

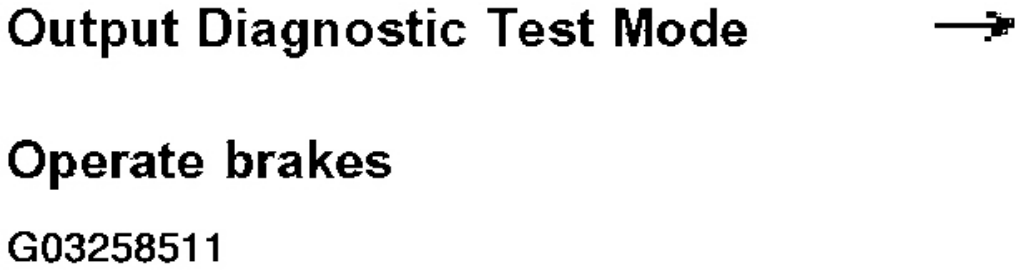


Fig. 88: V.A.G 1551 Scan Tool Display - Initiating Output Diagnostic Test Mode - Function 03 (28 Of 37)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

- Indicate to second technician which wheel requires turning by hand.

If the wheel does not lock, a malfunction may exist in the mechanical and/or hydraulic section of the brake system.

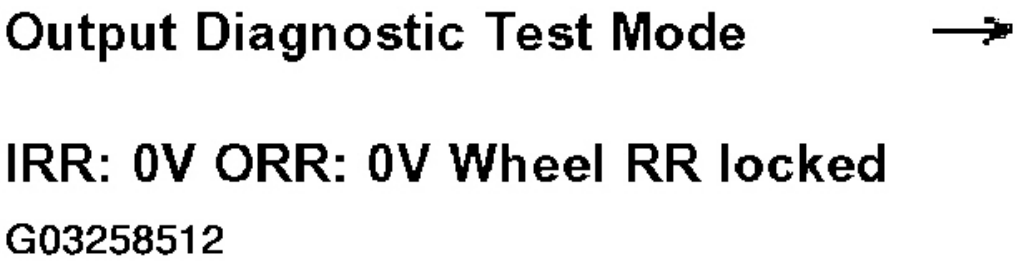


Fig. 89: V.A.G 1551 Scan Tool Display - Initiating Output Diagnostic Test Mode - Function 03 (29 Of 37)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Press --> button.

Indicated on display

- Press --> button.

ABS hydraulic pump display group number: must run.

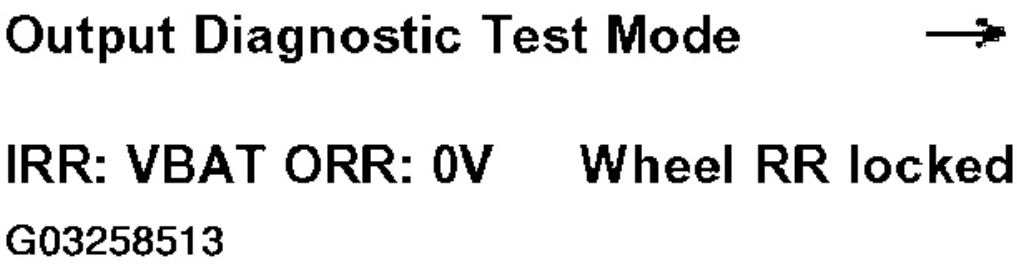


Fig. 90: V.A.G 1551 Scan Tool Display - Initiating Output Diagnostic Test Mode - Function 03 (30 Of 37)

Courtesy of VOLKSWAGEN OF AMERICA, INC.

Brake pedal must not give.

If the brake pedal gives, there is a malfunction in the hydraulic unit. In this case the hydraulic unit must be replaced:

See **ABS CONTROL MODULE AND HYDRAULIC UNIT, REMOVING AND INSTALLING** .

Indicated on display

- Indicate to second technician which wheel requires turning by hand.

If the wheel locks it is possible that the brake lines to the wheel calipers have been interchanged.

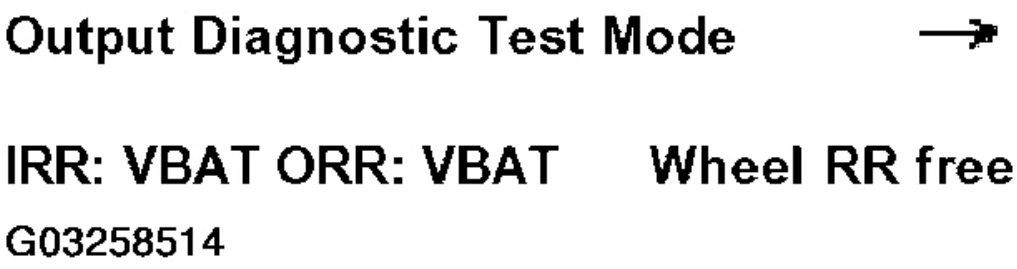


Fig. 91: V.A.G 1551 Scan Tool Display - Initiating Output Diagnostic Test Mode - Function 03 (31 Of 37)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Press --> button.

ABS hydraulic pump display group number: no longer runs.

Indicated on display

- Press --> button.

Brake pedal must give noticeably.

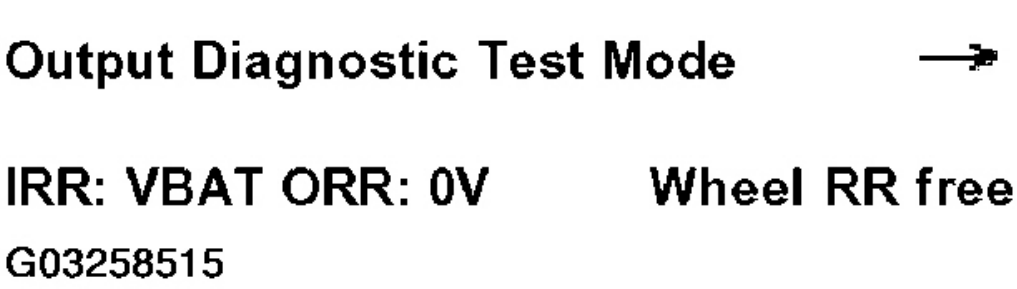


Fig. 92: V.A.G 1551 Scan Tool Display - Initiating Output Diagnostic Test Mode - Function 03 (32 Of 37)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

If the brake pedal does not give, there is a malfunction in the hydraulic unit. In this case the hydraulic unit must be replaced:

See **ABS CONTROL MODULE AND HYDRAULIC UNIT, REMOVING AND INSTALLING** .

Indicated on display

- Indicate to second technician which wheel requires turning by hand.

If the wheel does not lock, a malfunction may exist in the mechanical and/or hydraulic section of the brake system.

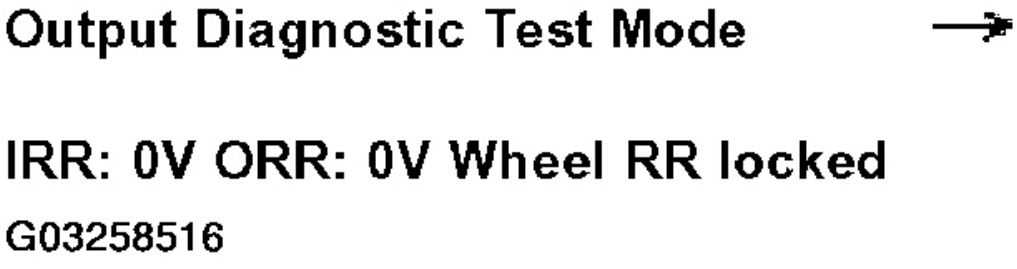


Fig. 93: V.A.G 1551 Scan Tool Display - Initiating Output Diagnostic Test Mode - Function 03 (33 Of 37)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Press --> button.

Indicated on display

- Remove foot from brake pedal.
- Press --> button.

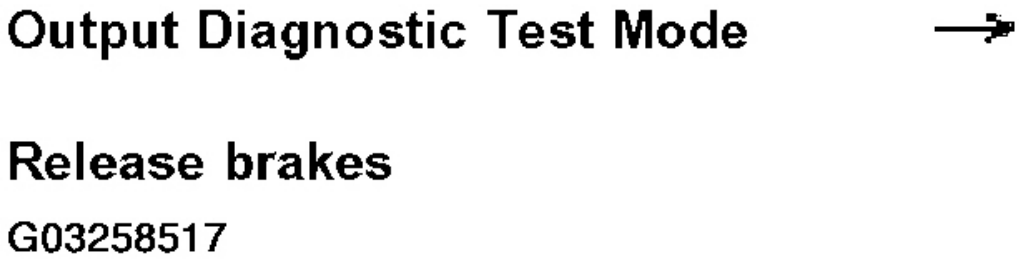


Fig. 94: V.A.G 1551 Scan Tool Display - Initiating Output Diagnostic Test Mode - Function 03 (34 Of 37)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display (vehicles with EDL)

A second technician is required to rotate the respective wheel by hand.

If the wheels do not lock, there is a malfunction in the hydraulic part of ABS system. In this case the hydraulic unit must be replaced:

See **ABS CONTROL MODULE AND HYDRAULIC UNIT, REMOVING AND INSTALLING** .

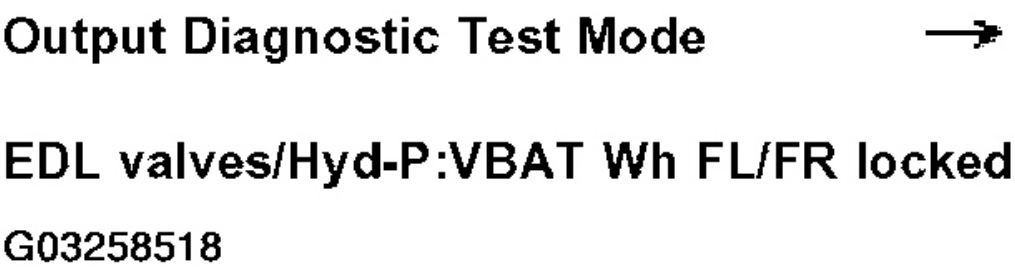


Fig. 95: V.A.G 1551 Scan Tool Display - Initiating Output Diagnostic Test Mode - Function 03 (35 Of 37)

Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Press --> button.

ABS warning lamp -K47- goes out.

Indicated on display

Output Diagnostic Test Mode (DTM) is completed.

- Press --> button.

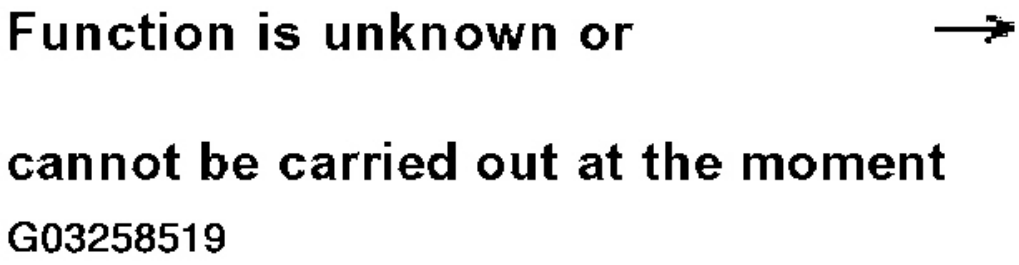


Fig. 96: V.A.G 1551 Scan Tool Display - Initiating Output Diagnostic Test Mode - Function 03 (36 Of 37)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

NOTE:

- **If ABS warning lamp does not go out there is a malfunction in the system.**
- **Adhere exactly to the test sequence: first check DTC memory, then erase.**

- End Output (scan tool function 06), see **END OUTPUT (FUNCTION 06)** .

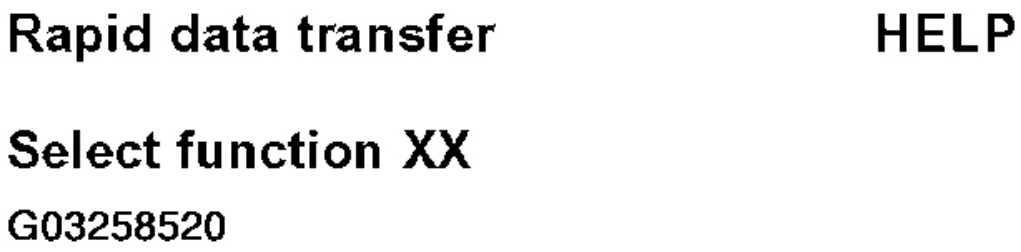


Fig. 97: V.A.G 1551 Scan Tool Display - Initiating Output Diagnostic Test Mode - Function 03 (37 Of 37)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Checking data bus wiring

Display group number 125

- Press keys 1, 2 and 5
- Confirm entry with key Q.

There are always 4 display zones -arrows- in the measured value block. Decoding the individual values in display zones 1 to 4 can be read from the following tables.

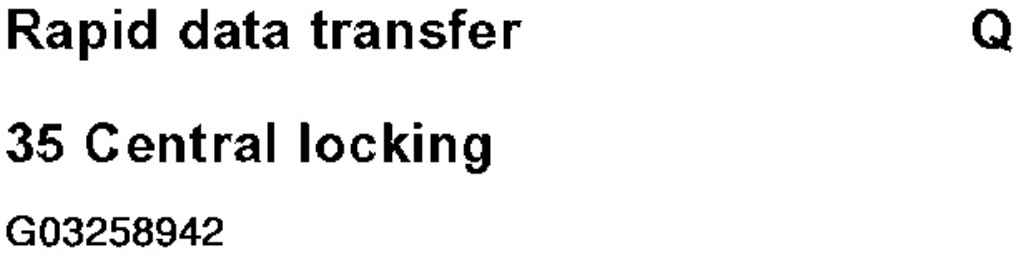


Fig. 98: V.A.G 1551 Scan Tool Display - Checking Data Bus Wiring (1 Of 2)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display: (vehicle stationary)

Press C key for the next display group number entry.

If the --> key is pressed, keys 0 and 8 for work sequence "Read measured value block" must be pressed again afterwards to regain entry.

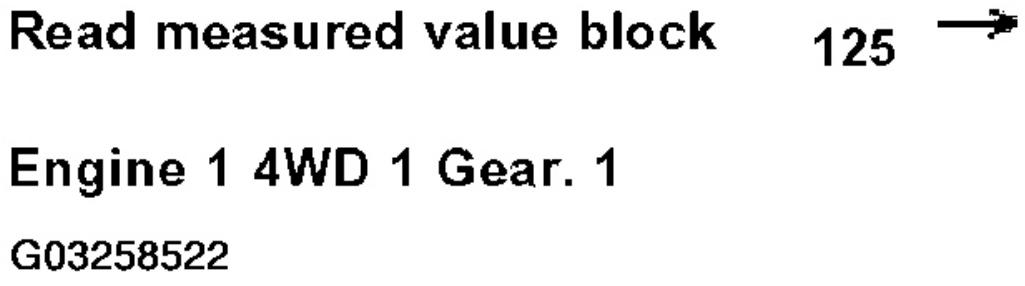


Fig. 99: V.A.G 1551 Scan Tool Display - Checking Data Bus Wiring (2 Of 2)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

MEASURING VALUE BLOCK 125

<table>
<tr><td colspan="3">Read measured value block</td><td>125 --></td><td>Display group number: 125</td></tr>
<tr><td>Engine 1</td><td>AWD 1</td><td>Gear. 1</td><td></td><td>Indicated on display (example)</td></tr>
<tr><td></td><td></td><td></td><td></td><td>Vacant</td></tr>
<tr><td></td><td></td><td></td><td colspan="2">Data bus connection for transmission(1))
• 1 --> Data bus connection is available.
• 0 --> Data bus connection is not available.(3)</td></tr>
<tr><td></td><td></td><td colspan="3">Data bus for all-wheel drive(2)
• 1 --> Data bus connection is available.
• 0 --> Data bus connection is available.</td></tr>
<tr><td></td><td colspan="4">Data bus for engine
• 1 --> Data bus connection is available.
• 0 --> Data bus connection is not available.</td></tr>
<tr><td colspan="5">(1) Vehicles with automatic transmission only. Incorrect transmission control module or incorrect transmission control module coding. Transmission control module faulty.
(2) All wheel drive vehicles with Haldex coupling only.
(3) Data bus connection is interrupted or data bus wires are interchanged.</td></tr>
</table>

BASIC SETTING (FUNCTION 04)

Special tools and test equipment

- VAS 5234 brake filler and bleeder unit

On vehicles with EDL the basic setting is used to bleed the hydraulic unit only. The brake system must be bleed separately .

See **BLEEDING BRAKE SYSTEM** .

Basic setting is only necessary when at least one brake fluid reservoir chamber is completely empty (e.g. leaks in brake system).

Basic settings must also be carried out after a leaking brake system has been serviced.

- Connect VAS 5234 brake filler and bleeder unit.
- Connect VAG1551 scan tool and insert "Brake Electronics" address word 03 with ignition switched on **VAG1551 SCAN TOOL (ST), CONNECTING AND SELECTING FUNCTION** .

Fig. 100: Identifying VAS 5234 Brake Filler And Bleeder Unit
Courtesy of VOLKSWAGEN OF AMERICA, INC.

NOTE: The basic setting to bleed the hydraulic unit is only required when one chamber of the brake fluid reservoir is completely empty.

Indicated on display

- Press buttons -0- and -4- to select "Basic Setting" function 04.

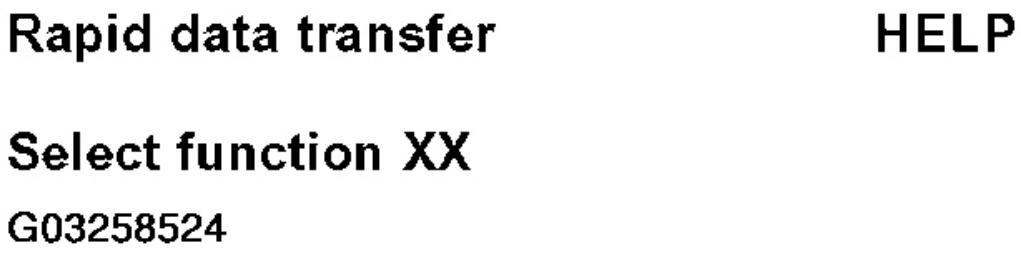


Fig. 101: V.A.G 1551 Scan Tool Display - Initiating Basic Setting - Function 04 (1 Of 39)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

- Press -Q- button to confirm input.

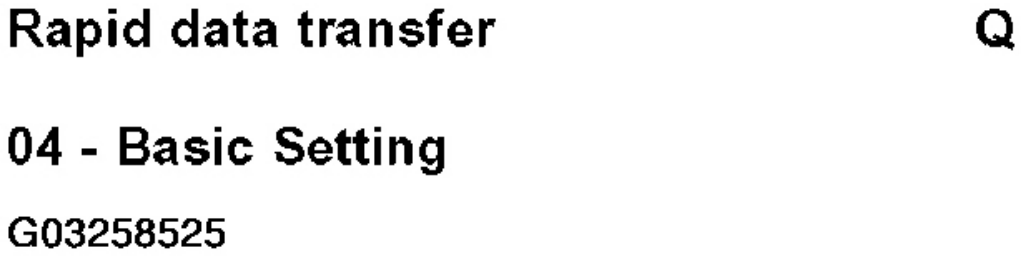


Fig. 102: V.A.G 1551 Scan Tool Display - Initiating Basic Setting - Function 04 (2 Of 39)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

- Press buttons -0-, -0- and -1- to input display group number 1 (001).
- Press -Q- button to confirm input.

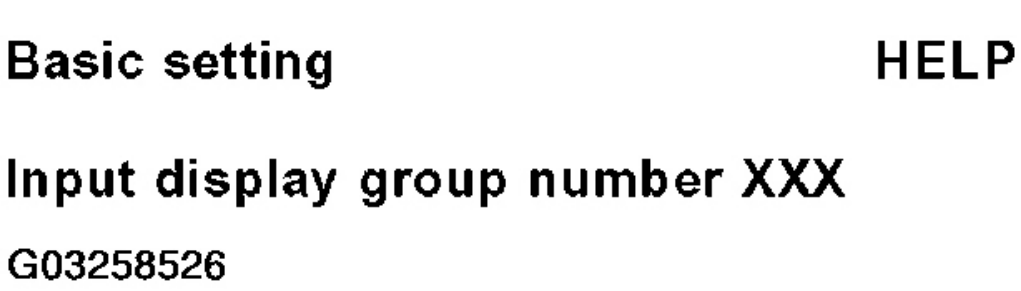


Fig. 103: V.A.G 1551 Scan Tool Display - Initiating Basic Setting - Function 04 (3 Of 39)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

- Operate pedal with substantial foot pressure and hold.
  - Pedal moves down.
  - Hydraulic pump runs.
  - Pedal comes back.

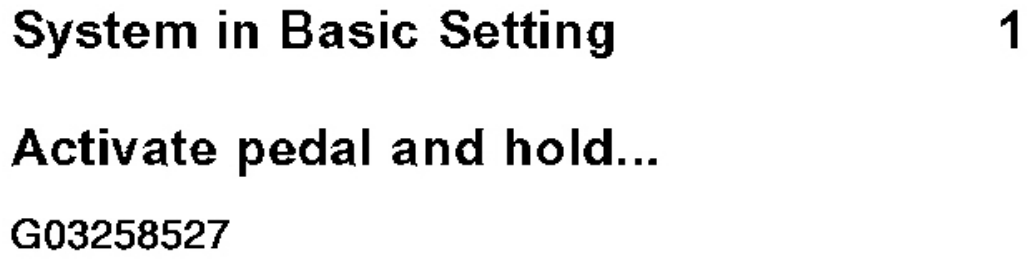


Fig. 104: V.A.G 1551 Scan Tool Display - Initiating Basic Setting - Function 04 (4 Of 39)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

- Press key 3 on VAG 1551 or arrow up key on VAS 5051.

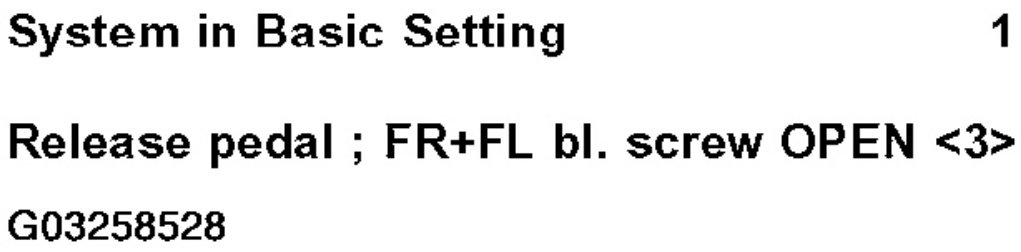


Fig. 105: V.A.G 1551 Scan Tool Display - Initiating Basic Setting - Function 04 (5 Of 39)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

Hydraulic pump runs.

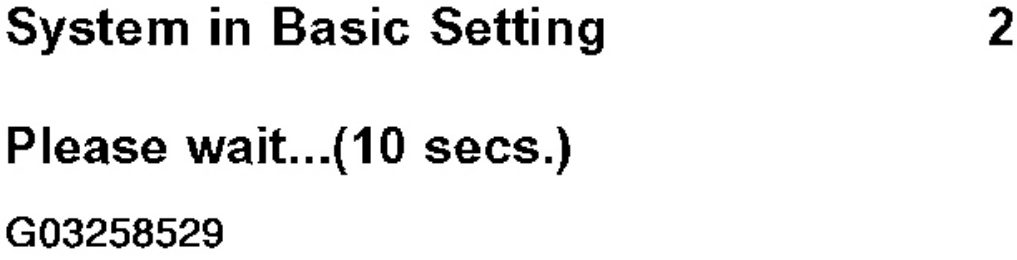


Fig. 106: V.A.G 1551 Scan Tool Display - Initiating Basic Setting - Function 04 (6 Of 39)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

- Press key 3 on VAG 1551 or arrow up key on VAS 5051.

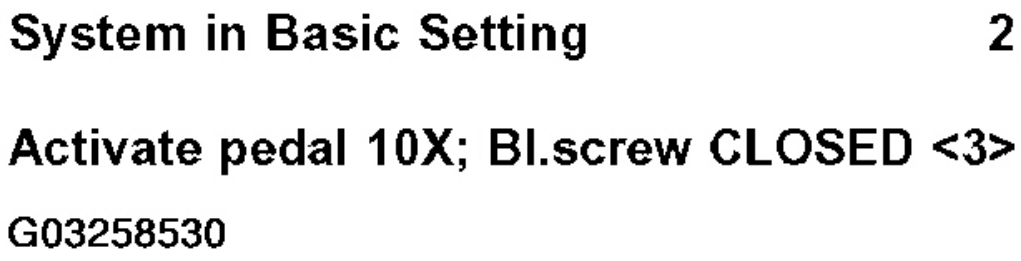


Fig. 107: V.A.G 1551 Scan Tool Display - Initiating Basic Setting - Function 04 (7 Of 39)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

- Operate pedal with substantial foot pressure and hold.
  - Pedal moves down
  - Hydraulic pump runs
  - Pedal comes back

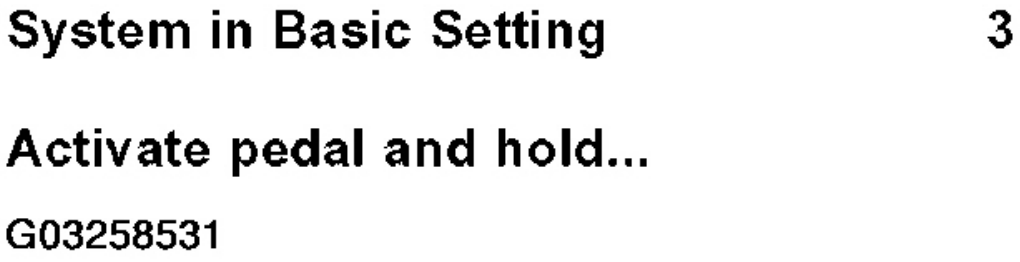


Fig. 108: V.A.G 1551 Scan Tool Display - Initiating Basic Setting - Function 04 (8 Of 39)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

- Press key 3 on VAG 1551 or arrow up key on VAS 5051.

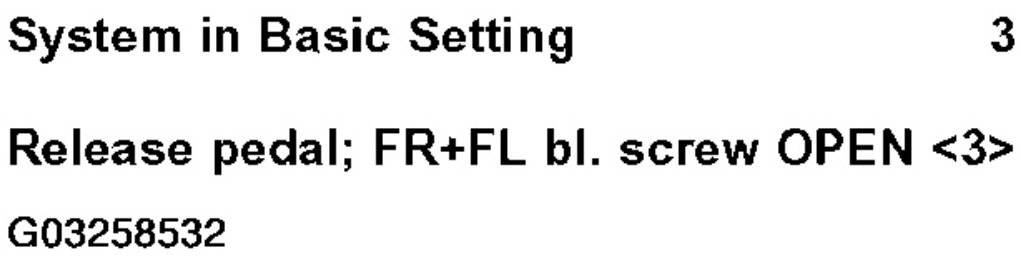


Fig. 109: V.A.G 1551 Scan Tool Display - Initiating Basic Setting - Function 04 (9 Of 39)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

Hydraulic pump runs.

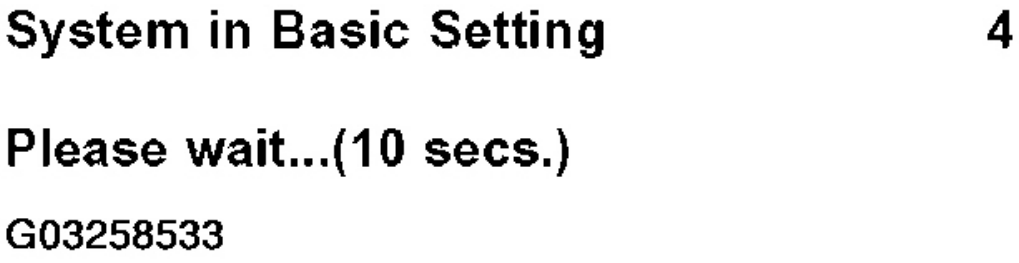


Fig. 110: V.A.G 1551 Scan Tool Display - Initiating Basic Setting - Function 04 (10 Of 39)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

- Press key 3 on VAG 1551 or arrow up key on VAS 5051.

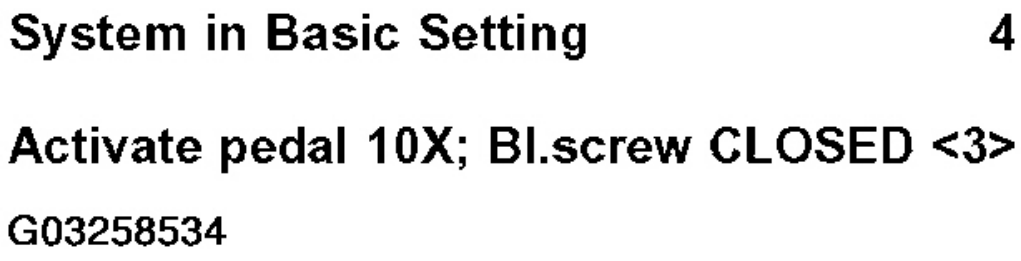


Fig. 111: V.A.G 1551 Scan Tool Display - Initiating Basic Setting - Function 04 (11 Of 39)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

- Operate pedal with substantial foot pressure and hold.
  - Pedal moves down
  - Hydraulic pump runs
  - Pedal comes back

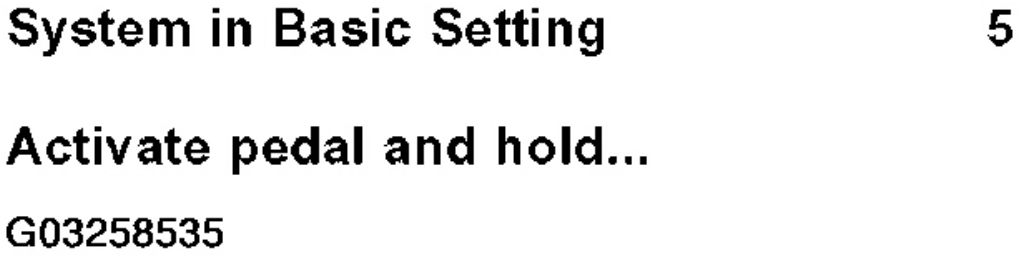


Fig. 112: V.A.G 1551 Scan Tool Display - Initiating Basic Setting - Function 04 (12 Of 39)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

- Press key 3 on VAG 1551 or arrow up key on VAS 5051.

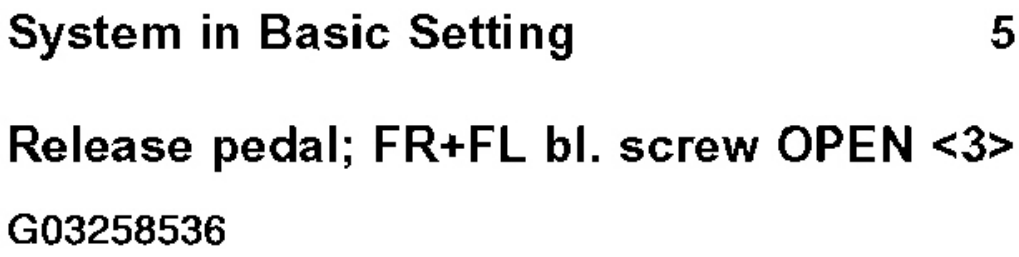


Fig. 113: V.A.G 1551 Scan Tool Display - Initiating Basic Setting - Function 04 (13 Of 39)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

Hydraulic pump runs.

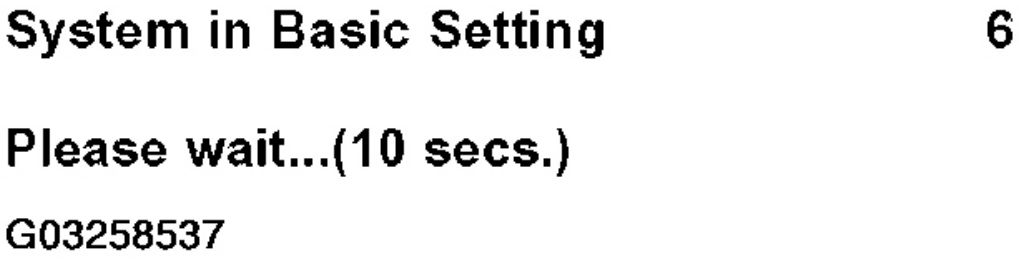


Fig. 114: V.A.G 1551 Scan Tool Display - Initiating Basic Setting - Function 04 (14 Of 39)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

- Press key 3 on VAG 1551 or arrow up key on VAS 5051.

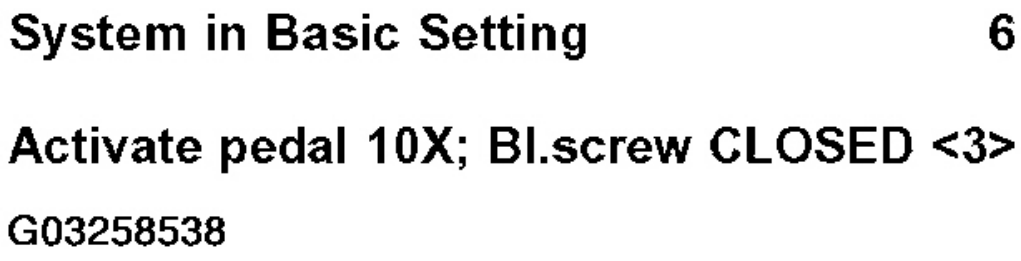


Fig. 115: V.A.G 1551 Scan Tool Display - Initiating Basic Setting - Function 04 (15 Of 39)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

- Operate pedal with substantial foot pressure and hold.
  - Pedal moves down
  - Hydraulic pump runs
  - Pedal comes back

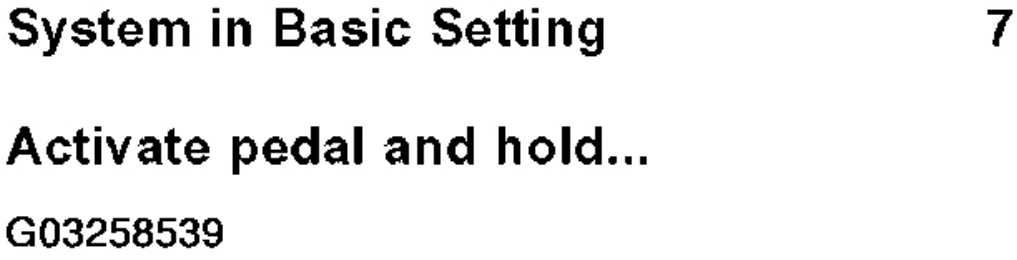


Fig. 116: V.A.G 1551 Scan Tool Display - Initiating Basic Setting - Function 04 (16 Of 39)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

- Press key 3 on VAG 1551 or arrow up key on VAS 5051.

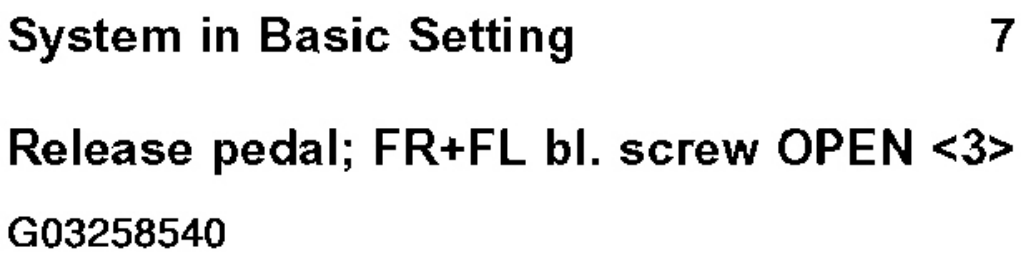


Fig. 117: V.A.G 1551 Scan Tool Display - Initiating Basic Setting - Function 04 (17 Of 39)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

Hydraulic pump runs.

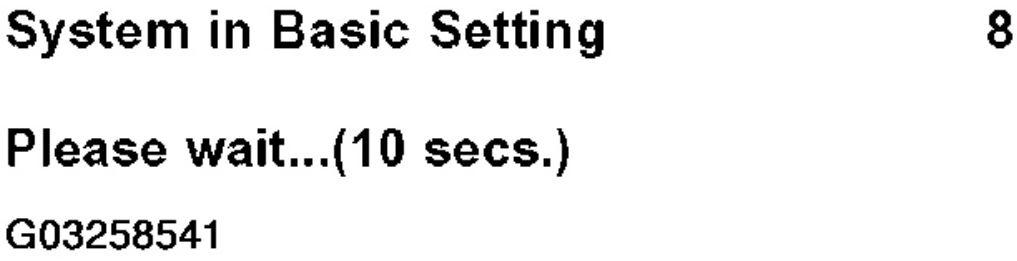


Fig. 118: V.A.G 1551 Scan Tool Display - Initiating Basic Setting - Function 04 (18 Of 39)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

- Press key 3 on VAG 1551 or arrow up key on VAS 5051.

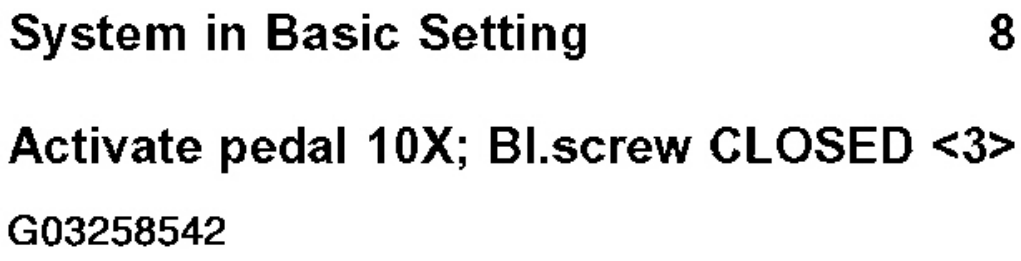


Fig. 119: V.A.G 1551 Scan Tool Display - Initiating Basic Setting - Function 04 (19 Of 39)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

- Operate pedal with substantial foot pressure and hold.
  - Pedal moves down
  - Hydraulic pump runs
  - Pedal comes back

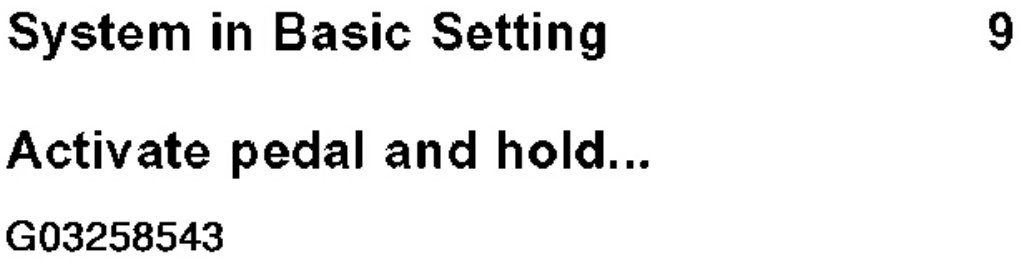


Fig. 120: V.A.G 1551 Scan Tool Display - Initiating Basic Setting - Function 04 (20 Of 39)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

- Press key 3 on VAG 1551 or arrow up key on VAS 5051.

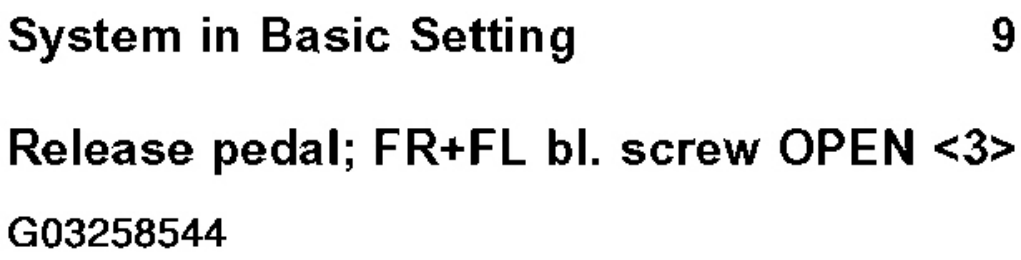


Fig. 121: V.A.G 1551 Scan Tool Display - Initiating Basic Setting - Function 04 (21 Of 39)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

Hydraulic pump runs.

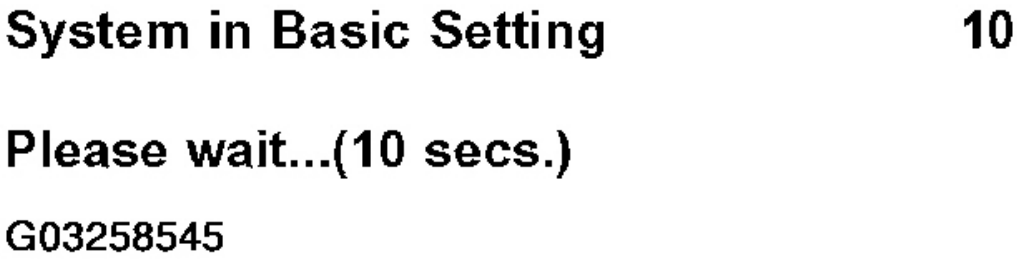


Fig. 122: V.A.G 1551 Scan Tool Display - Initiating Basic Setting - Function 04 (22 Of 39)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

- Press key 3 on VAG 1551 or arrow up key on VAS 5051.

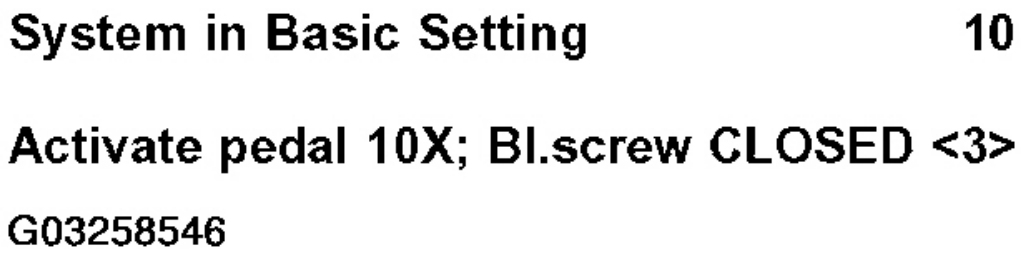


Fig. 123: V.A.G 1551 Scan Tool Display - Initiating Basic Setting - Function 04 (23 Of 39)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

- Operate pedal with substantial foot pressure and hold.
  - Pedal moves down
  - Hydraulic pump runs
  - Pedal comes back

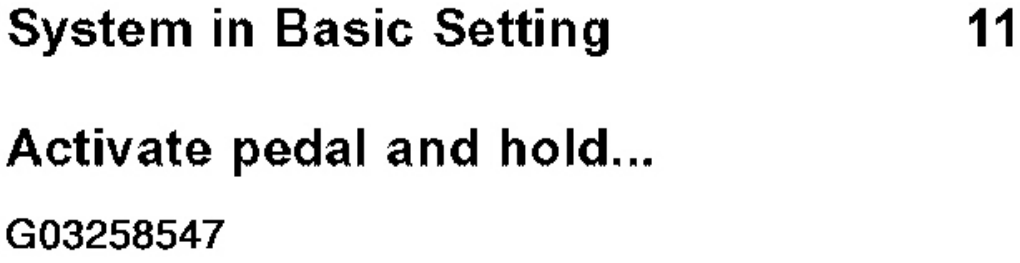


Fig. 124: V.A.G 1551 Scan Tool Display - Initiating Basic Setting - Function 04 (24 Of 39)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

- Press key 3 on VAG 1551 or arrow up key on VAS 5051.

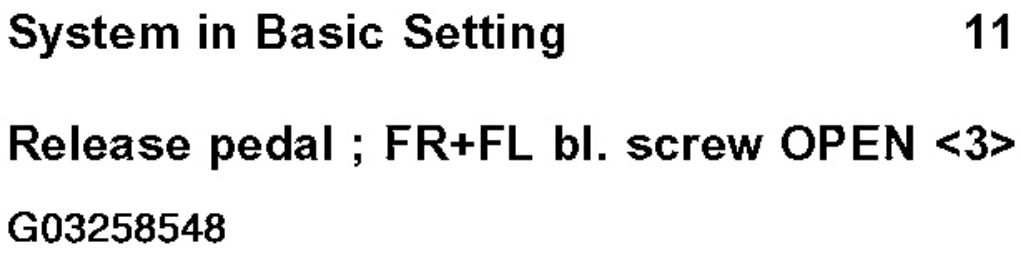


Fig. 125: V.A.G 1551 Scan Tool Display - Initiating Basic Setting - Function 04 (25 Of 39)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

Hydraulic pump runs.

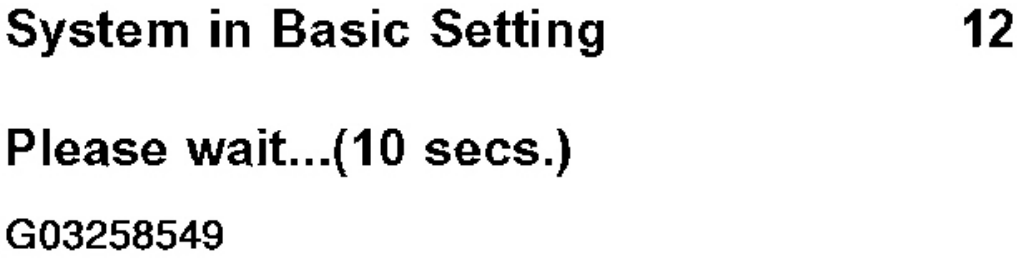


Fig. 126: V.A.G 1551 Scan Tool Display - Initiating Basic Setting - Function 04 (26 Of 39)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

- Press key 3 on VAG 1551 or arrow up key on VAS 5051.

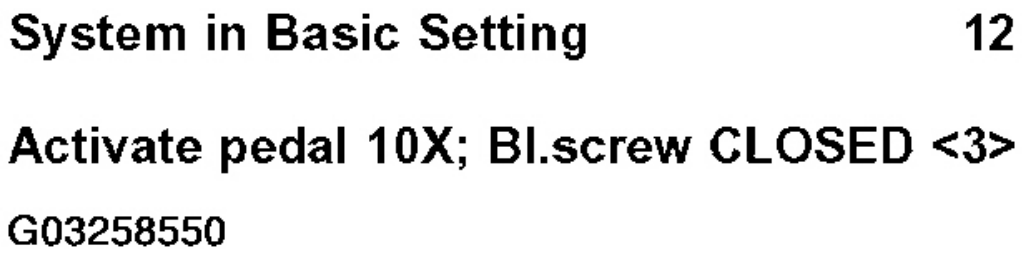


Fig. 127: V.A.G 1551 Scan Tool Display - Initiating Basic Setting - Function 04 (27 Of 39)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

- Operate pedal with substantial foot pressure and hold.
  - Pedal moves down
  - Hydraulic pump runs
  - Pedal comes back

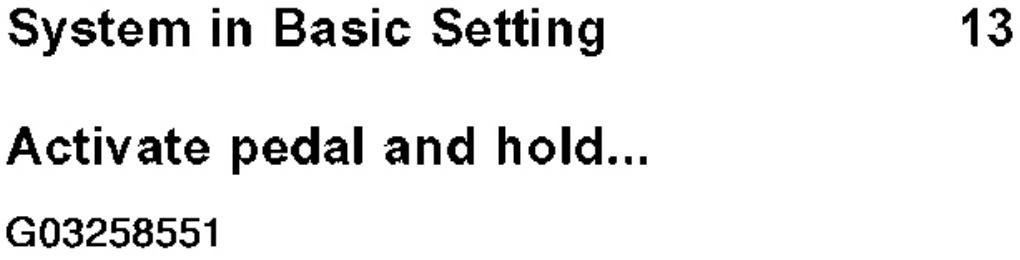


Fig. 128: V.A.G 1551 Scan Tool Display - Initiating Basic Setting - Function 04 (28 Of 39)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

- Press key 3 on VAG 1551 or arrow up key on VAS 5051.

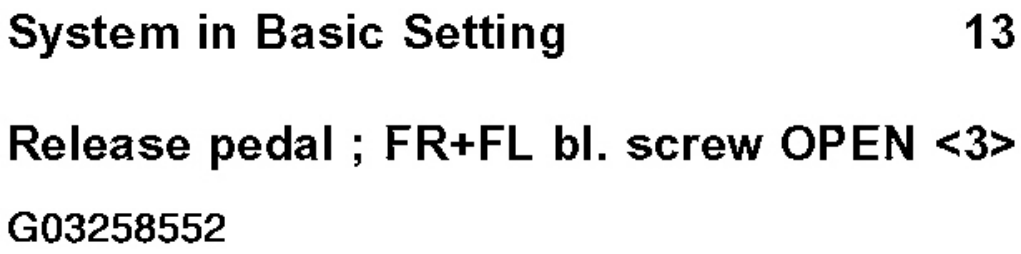


Fig. 129: V.A.G 1551 Scan Tool Display - Initiating Basic Setting - Function 04 (29 Of 39)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

Hydraulic pump runs.

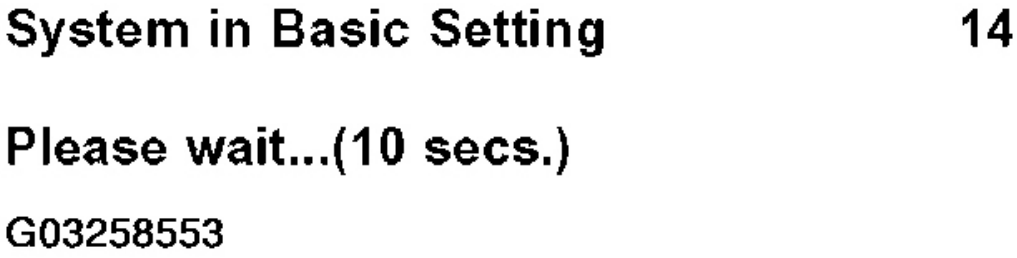


Fig. 130: V.A.G 1551 Scan Tool Display - Initiating Basic Setting - Function 04 (30 Of 39)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

- Press key 3 on VAG 1551 or arrow up key on VAS 5051.

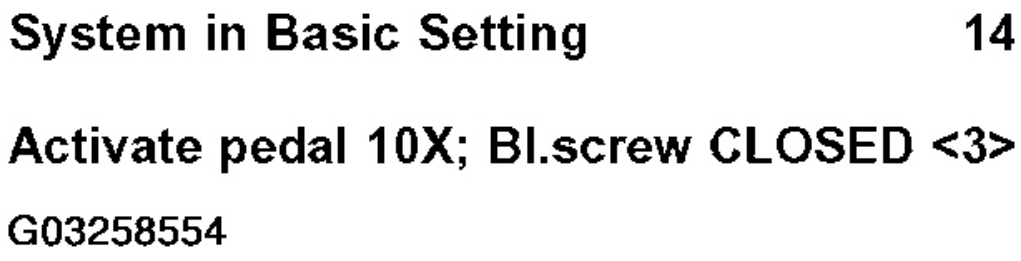


Fig. 131: V.A.G 1551 Scan Tool Display - Initiating Basic Setting - Function 04 (31 Of 39)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

- Operate pedal with substantial foot pressure and hold.
  - Pedal moves down
  - Hydraulic pump runs
  - Pedal comes back

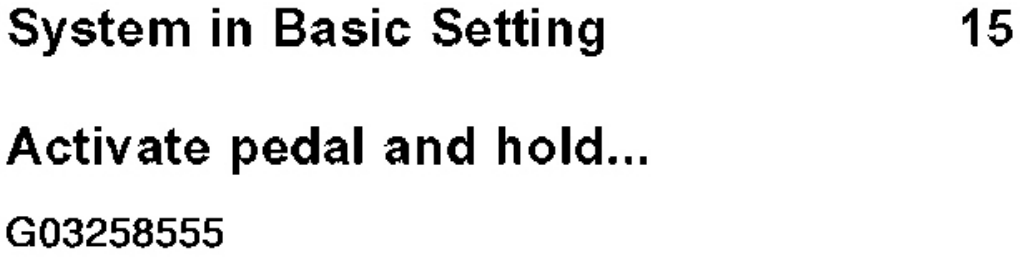


Fig. 132: V.A.G 1551 Scan Tool Display - Initiating Basic Setting - Function 04 (32 Of 39)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

- Press key 3 on VAG 1551 or arrow up key on VAS 5051.

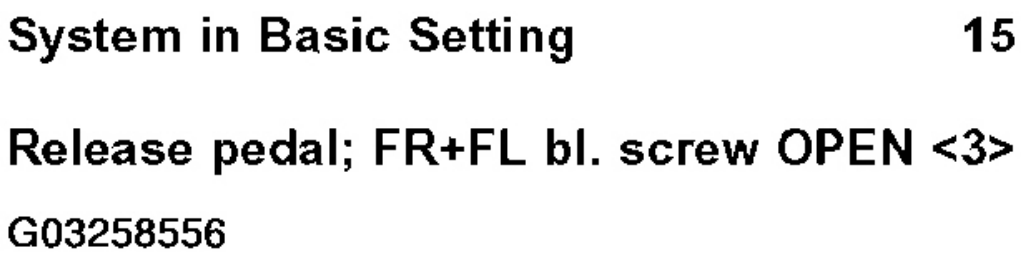


Fig. 133: V.A.G 1551 Scan Tool Display - Initiating Basic Setting - Function 04 (33 Of 39)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

Hydraulic pump runs.

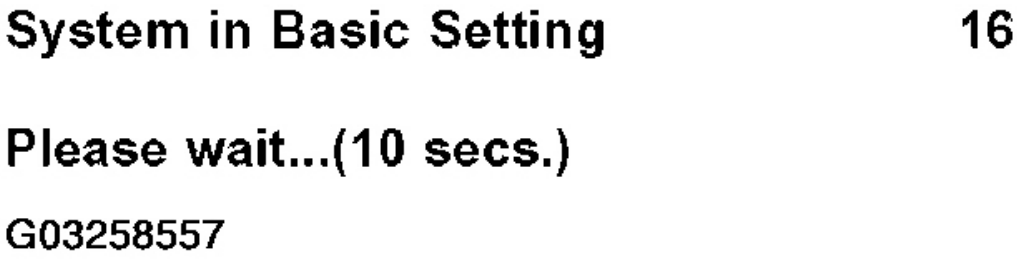


Fig. 134: V.A.G 1551 Scan Tool Display - Initiating Basic Setting - Function 04 (34 Of 39)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

- Press key 3 on VAG 1551 or arrow up key on VAS 5051.

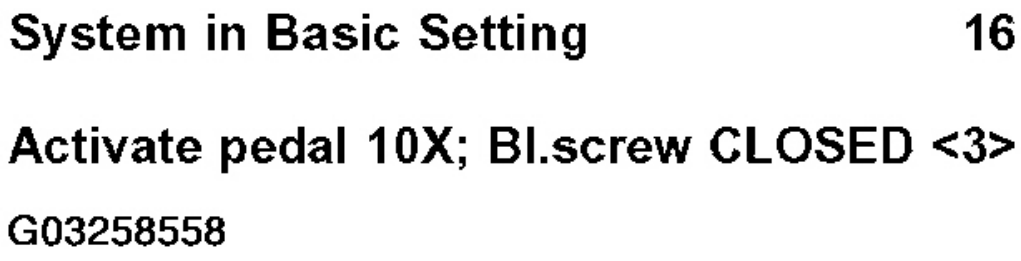


Fig. 135: V.A.G 1551 Scan Tool Display - Initiating Basic Setting - Function 04 (35 Of 39)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

- Press --> button.

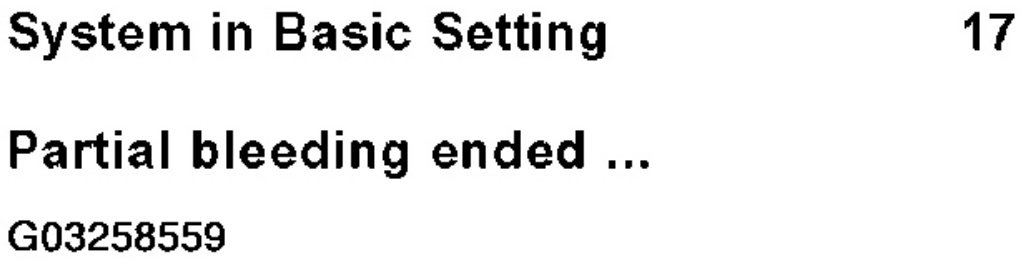


Fig. 136: V.A.G 1551 Scan Tool Display - Initiating Basic Setting - Function 04 (36 Of 39)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

- Press buttons -0- and -6- to select "End Output" function 06.

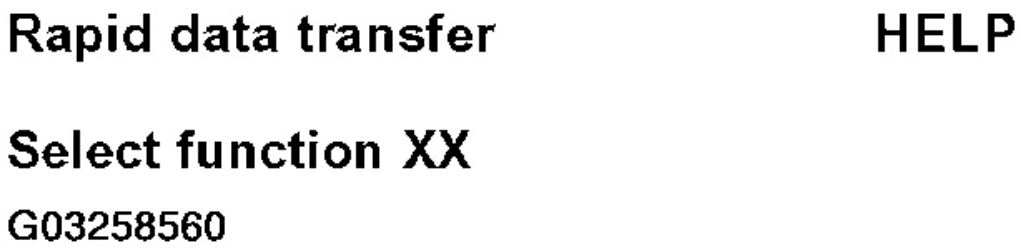


Fig. 137: V.A.G 1551 Scan Tool Display - Initiating Basic Setting - Function 04 (37 Of 39)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

- Press -Q- button to confirm input.

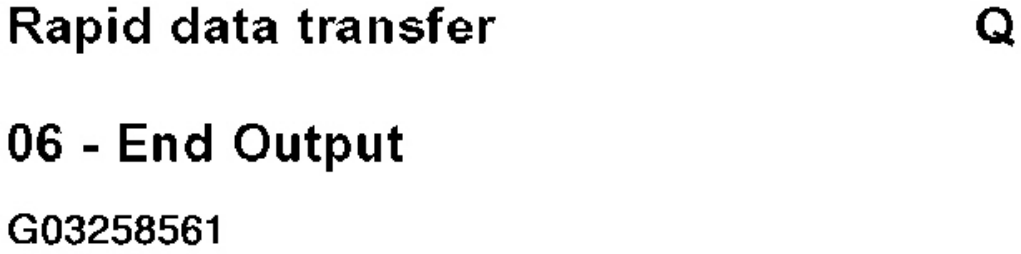


Fig. 138: V.A.G 1551 Scan Tool Display - Initiating Basic Setting - Function 04 (38 Of 39)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

- Press -C- button.
- Switch ignition off.
- Disconnect VAG1551 scan tool from Data Link Connector (DLC).

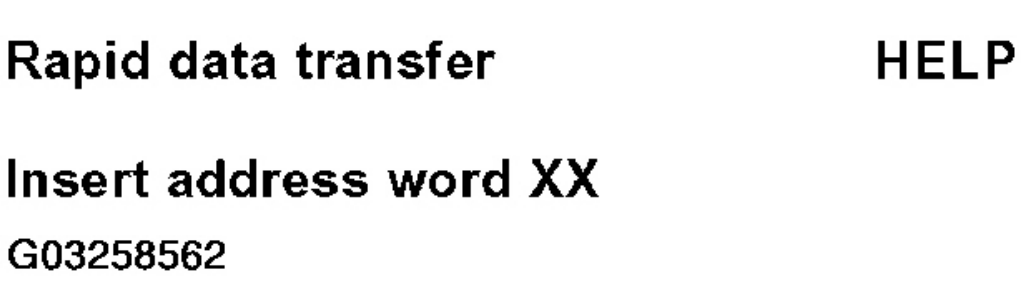


Fig. 139: V.A.G 1551 Scan Tool Display - Initiating Basic Setting - Function 04 (39 Of 39)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

The brake system must be bled.

The basic setting is used to bleed the hydraulic unit only. The brake system must be bleed separately .

See **BLEEDING BRAKE SYSTEM** .

ELECTRICAL TESTING

SPECIAL TOOLS AND EQUIPMENT

- VAG1598/21 adapter
- VW1594A connector test kit
- Multimeter (Fluke 83 or equivalent)
- VAG1921 pliers

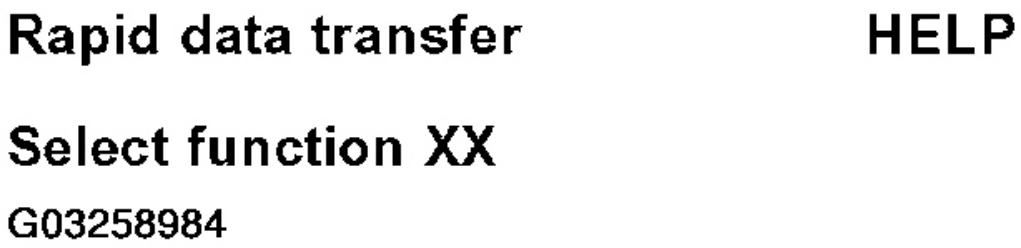


Fig. 140: Identifying Special Tools And Equipment

Courtesy of VOLKSWAGEN OF AMERICA, INC.

- If On Board Diagnostic (OBD) does not give any indication of the source of the malfunction, carry out all of the electrical test steps.
- If On Board Diagnostic (OBD) provides a direct indication of the source of the malfunction, only carry out the test steps recommended in the DTC table (specific testing).

An overview of all the test steps in the Electrical test table can be found on **TEST STEP OVERVIEW** .

TEST REQUIREMENTS

- Ignition and electrical consumers switched off before beginning the check (headlights, lighting, fan, etc.)
- Fuses -S9-, -S13-, -S20-, -S178-, -S179- must be OK (remove fuses from fuse holder to check)

REMOVING AIR CLEANER

- Pull harness connector -2- off Mass Air Flow (MAF) sensor.
- Release spring-type clip on air duct hose -1- using VAG1921 pliers and pull hose off air cleaner.
- Remove air cleaner bolts -3- -4- and take out air cleaner

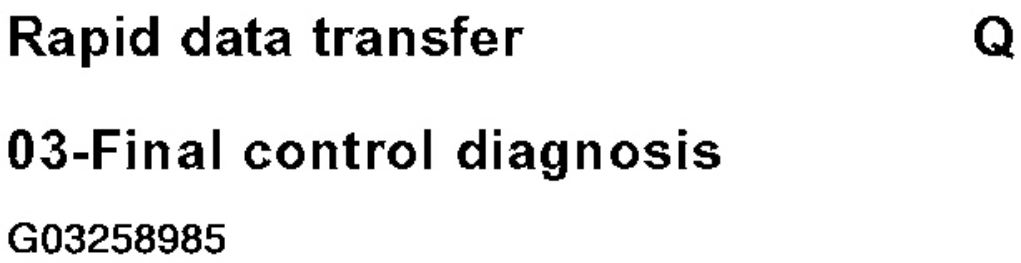


Fig. 141: Pulling Harness Connector Off Mass Air Flow (MAF) Sensor
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Release control module harness connector (arrow -1-) and pull off (arrow -2-).

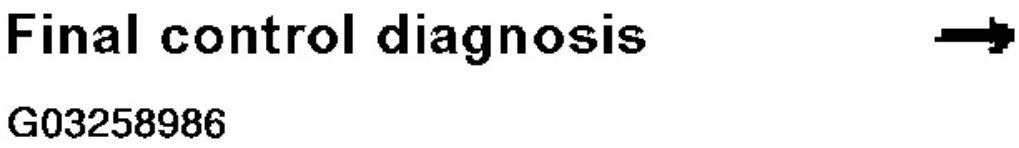


Fig. 142: Releasing Control Module Harness Connector
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Pull multi-pin harness connector off ABS control module (w/EDL) -J104- and connect VAG1598/21 test box (-1-) to harness connector -2-.

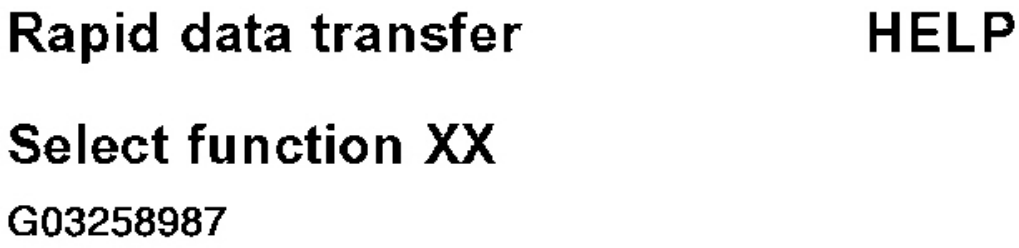


Fig. 143: Pulling Multi-Pin Harness Connector Off ABS Control Module (W/EDL) -J104- And Connecting VAG1598/21 Test Box To Harness Connector
Courtesy of VOLKSWAGEN OF AMERICA, INC.

The specified values are matched to the multimeter (Fluke 83 or equivalent) and are not necessarily applicable for other test units.

MULTI-PIN HARNESS CONNECTOR WITH TERMINAL ASSIGNMENT

NOTE: All terminals not listed are currently not assigned and must never be connected to other components!

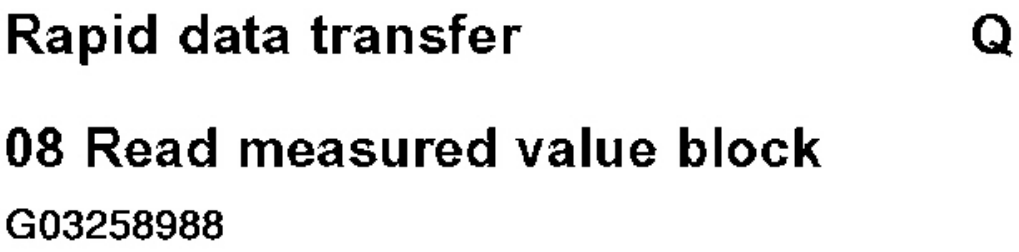


Fig. 144: Identifying Data Link Connector Terminals For Voltage Supply
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Data Link Connector (DLC) for voltage supply and On Board Diagnostic (OBD) with the VAG1551 Scan Tool (ST) terminal assignment

Terminal 4 = Ground (terminal 31)

Terminal 16 = Positive (terminal 30) via -S12-

Terminal 7 = K-wire via connection in instrument panel wiring harness to ABS control module (w/EDL) -J104- terminal 7

T25 harness connector and ABS control module (w/EDL) -J104- terminal assignment

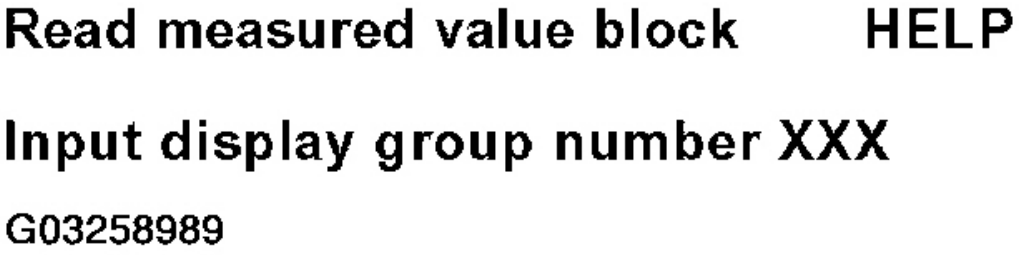


Fig. 145: Identifying T25 Harness Connector And ABS Control Module (W/EDL) -J104- Terminal Assignment
Courtesy of VOLKSWAGEN OF AMERICA, INC.

CAN-bus control diagram

NOTE: The following list refers to items in Fig. 146 .

1. Automatic Transmission Control Module (TCM)
2. Bus driver 3-ECM
3. Bus-driver
4. Terminating impedance
5. CAN-bus
6. Terminating impedance
7. Bus driver
8. ABS control module (w/EDL) -J104-

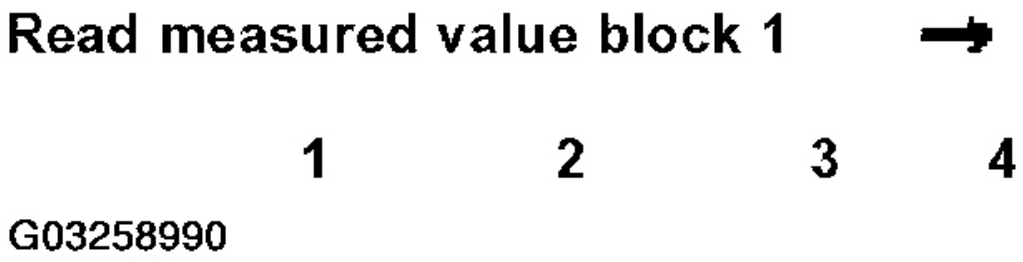


Fig. 146: CAN-Bus Control Diagram
Courtesy of VOLKSWAGEN OF AMERICA, INC.

MULTIPIN HARNESS CONNECTORS TERMINALS CONNECTION - T25 HARNESS CONNECTOR AND ABS CONTROL MODULE (W/EDL)

Terminal	Connected to...
1	Left-front ABS wheel speed sensor -G47-
2	Left-front ABS wheel speed sensor -G47-
3	Coding bridge to terminal 14
4	Voltage supply terminal X
5	Left-rear ABS wheel speed sensor -G46-
6	Left-rear ABS wheel speed sensor -G46-
7	T16/7 harness connector, K wire
8	Ground (GND) point at left side of engine compartment and Ground (GND) connection in engine compartment wiring harness
9	B+ via -S179-
10	CAN-bus wire[1)] wiring diagrams
11	CAN-bus wire[1)] wiring diagrams

12	not used
14	Coding bridge to terminal 3
15	not used
16	ABS warning lamp activation
18	Brake light switch -F-
19	Right-front ABS wheel speed sensor -G45-
20	Right-front ABS wheel speed sensor -G45-
21	not used
22	Right-rear ABS wheel speed sensor -G44-
23	Right-rear ABS wheel speed sensor -G44-
24	Ground (GND) point at left side of engine compartment and Ground (GND) connection in engine compartment wiring harness
25	B+ via -S178-

Test step overview

TEST STEP OVERVIEW

Voltage supply for pump motor (terminal 30) on ABS control module -J104-	Test step 1
Voltage supply for valves (terminal 30) on ABS control module -J104-	Test step 2
Voltage supply (terminal X) on control module	Test step 3
Function of brake light switch -F-	Test step 4
Right-front ABS wheel speed sensor -G45- resistance	Test step 5
Left-front ABS wheel speed sensor -G47- resistance	Test step 6
Right-rear ABS wheel speed sensor -G44- resistance	Test step 7
Left-rear ABS wheel speed sensor -G46- resistance	Test step 8
Right-front ABS wheel speed sensor -G45- voltage signal	Test step 9
Left-front ABS wheel speed sensor -G47- voltage signal	Test step 10
Right-rear ABS wheel speed sensor -G44- voltage signal	Test step 11
Left-rear ABS wheel speed sensor -G46- voltage signal	Test step 12
Coding bridge	Test step 13
Voltage supply for VAG 1551, T16 harness connector	Test step 14
Resistance of K wire for On Board Diagnostic (OBD), harness connector T16	Test step 15
Warning lamp function for ABS -K47-	Test step 16
Hydraulic pump -V64- function	Test step 17
CAN-bus wire (resistance)	Test step 18
CAN-bus wire (short circuit to B+)	Test step 19
Longitudinal acceleration sensor -G251- wiring	Test step 20
Function of warning light for brake system -K118-	Test step 21
Function of ASR control lamp -K155-	Test step 22

ELECTRICAL TEST TABLE

NOTE:

- **The socket designations of adapter VAG1598/21 are identical to ABS control module (w/EDL) -J104- terminal designations in the wiring diagram.**
- **If the readings obtained deviate from the specifications, carry out "corrective action" measures in the right side of the table.**
- **Use only the VW1594A connector test kit to check continuity (bridging).**
- **If the measured figures only differ slightly from the specifications, clean the sockets and harness connectors of the testers and adapter leads (using contact spray G 000 700 04) and repeat the check. Before replacing components, check the wiring and connections again, particularly if the specification calls for a resistance reading of less than 10 ohms.**

VOLTAGE TEST - SWITCH TO 20V DC MEASURING RANGE

Voltage test - switch to 20V DC measuring range					
Test step	**VAG1598 sockets**	**Test of**	• **Test conditions** • **Additional operations**	**Specified value**	**Corrective action**
1	8 + 25	Voltage supply for pump motor (terminal 30) on ABS control module (w/EDL) -J104-	• Ignition off	10.0-14.5 V	• Check wire from terminal 25 to Ground (GND) • Check wire from terminal 8 via fuse -S178- to B+.
2	9 + 24	Voltage supply for pump motor (terminal 30) on ABS control module (w/EDL) -J104-	• Ignition off	10.0-14.5 V	• Check wire from terminal 9 to Ground (GND). • Check wire from terminal 24 via fuse -S179- to B+.
3	8 + 4	Voltage supply (terminal X) on control module	• Ignition on	10.0-14.5 V	• Check wire from terminal 4 via fuse -S9- and ignition switch to Ground (GND). • Check wire from terminal 8 to B+.
4	8 + 18	Function of brake light switch -F-	• Ignition off • Brake pedal not depressed	0.0-0.5 V	• Check fuse -S13- and brake light switch -F-. • Check wire from terminal 18 to Ground (GND).

			• Depress brake pedal.	10.0-14.5 V	• Check wire from terminal 18 to Ground (GND).

RESISTANCE TEST - SWITCH TO 2 K ohm MEASURING RANGE

Resistance test - switch to 2 k ohm measuring range					
Test step	**VAG1598 sockets**	**Test of**	• **Test conditions** • **Additional operations**	**Specified value**	**Corrective action**
5	19 + 20	Right front ABS wheel speed sensor - G45- resistance	• Ignition off	1.0-1.3 Kohm	• Check harness connector T2b. • Check resistance of wheel speed sensor (1.0 - 1.3 kohm). • Check wire to wheel speed sensor. • Move wire while testing (loose connection).

RESISTANCE MEASUREMENT (2 ohm)

Switch to measuring range: **Resistance measurement (2 ohm)**					
Test step	**V.A.G 1598 sockets**	**Item tested**	• **Test conditions** • **Additional operations**	**Specified value**	**Corrective action**
6	1 +2	Resistance of left front ABS wheel speed sensor -G47-	• Ignition switched off	1.0 to 1.3 Kohm	• Separate connector on speed sensor -G47
					• Check wiring using wiring diagram
					• Wiggle wiring during test
					If no malfunction can be located in the wiring:
					• Replace left front ABS wheel speed sensor -G47-
					See **ABS SYSTEM COMPONENTS FOR FRONT AXLE, REMOVING**

					AND INSTALLING or **ABS SYSTEM COMPONENTS ON REAR AXLE, REMOVING AND INSTALLING** .
7	22 + 23	Resistance of right rear ABS wheel speed sensor -G44-	• Ignition switched off	1.0 to 1.3 Kohm	• Separate connector on right rear ABS wheel speed sensor -G44-
					• Check wiring using wiring diagram
					• Wiggle wiring during test
					If no malfunction can be located in the wiring:
					• Replace right rear ABS wheel speed sensor -G44-
					See **ABS SYSTEM COMPONENTS FOR FRONT AXLE, REMOVING AND INSTALLING** or **ABS SYSTEM COMPONENTS ON REAR AXLE, REMOVING AND INSTALLING** .
8	5 + 6	Resistance of left rear ABS wheel speed sensor -G46-	• Ignition switched off	1.0 to 1.3 K ohm	• Separate connector on speed sensor -G46
					• Check wiring using wiring diagram
					• Wiggle wiring during test
					If no malfunction can be located in the wiring:
					• Replace left rear ABS wheel speed sensor -G46-
					See **ABS SYSTEM COMPONENTS FOR FRONT AXLE, REMOVING AND INSTALLING** or **ABS SYSTEM COMPONENTS ON REAR AXLE, REMOVING AND INSTALLING** .

VOLTAGE TEST - SWITCH TO 2V AC MEASURING RANGE

Voltage test - switch to 2V AC measuring range					
			• **Test conditions**		

Test step	VAG1598 sockets	Test of	• Additional operations	Specified value	Corrective action
9	19 + 20	Right front ABS wheel speed sensor -G45- voltage signal	• Vehicle raised • Ignition off		• Check installation of wheel speed sensor and rotor.
			• Rotate right-front wheel at approx. 1 rev./sec.	65 mV AC minimum	• Check whether wheel speed sensor has been interchanged, see Read Measuring Value Block, see **READ MEASURING VALUE BLOCK (FUNCTION 08)** , display group 001.
10	1 +2	Left front ABS wheel speed sensor -G47- voltage signal	• Vehicle raised • Ignition off		• Check installation of wheel speed sensor and rotor.
			• Rotate left-front wheel at approx. 1 rev./sec.	65 mV AC minimum	• Check whether wheel speed sensor has been interchanged, see Read Measuring Value Block, see **READ MEASURING VALUE BLOCK (FUNCTION 08)** , display group 001.
11	22 + 23	Right rear ABS wheel speed sensor -G44- voltage signal	• Vehicle raised • Ignition off		• Check installation of wheel speed sensor and rotor.
			• Rotate right-rear wheel at approx. 1 rev./sec.	190 mV AC minimum	• Check whether wheel speed sensor has been interchanged, see Read Measuring Value Block, see **READ MEASURING VALUE BLOCK (FUNCTION 08)** , display group 001.
12	6 + 5	Left rear ABS wheel speed sensor -G46-	• Vehicle raised • Ignition off		• Check installation of wheel speed sensor and rotor.

		voltage signal			
			• Rotate left-rear wheel at approx. 1 rev./sec.	190mVAC minimum	• Check whether wheel speed sensor has been interchanged, see Read Measuring Value Block, see **READ MEASURING VALUE BLOCK (FUNCTION 08)** , display group 001.

RESISTANCE TEST - SWITCH TO 200 ohm MEASURING RANGE

Resistance test - switch to 200 ohm measuring range					
Test step	**VAG1598 sockets**	**Test of**	• **Test conditions** • **Additional operations**	**Specified value**	**Corrective action**
13	3 + 14	Coding bridge	• Ignition off	0.0-1.0 ohm	• Check wire and terminals in harness connector. • Replace coding bridge if different than specified value.

SWITCH TO 20 V DC MEASURING RANGE IN TEST

Switch to 20 V DC measuring range in test step 14 Switch to (200) Resistance measurement in test step 15					
Test step	**VAG1598 sockets**	**Test of**	• **Test conditions** • **Additional operations**	**Specified value**	**Corrective action**
14	-	Voltage supply for VAG1551, harness connector T16	• Connect multimeter (Fluke 83 or equivalent) with VW1594 adapter set to T16 (1) .		• Check wire from T16/4 to B+. • Check wire from T16/16 via -S12- to Ground (GND).
			• Terminal 4 - Ground (GND) • Terminal 16- B+	10.0-14.5 V	
			• Terminal 4 - Ground (GND) • Terminal 16- B+	10.0-14.5 V	
15	-	Resistance of the K-wire for On Board Diagnostic	• Ignition off • Using adapter set VW1594	Max. 1.5 W	• Check wire from terminal 7 to K wire.

		(OBD), harness connector T16	connect socket 7 of VAG1598/21 and terminal 7 of harness connector T16 to multimeter (Fluke 83 or equivalent).		

(1) Terminal assignment of Data Link Connector (DLC) for voltage supply and On Board Diagnostic (OBD) with the VAG1551 scan tool, see **MULTI-PIN HARNESS CONNECTOR WITH TERMINAL ASSIGNMENT** .

FUNCTIONAL CHECK: ABS WARNING LIGHT -K47-

Functional check: ABS warning light -K47-					
Test step	**VAG1598 sockets**	**Test of**	• **Test conditions** • **Additional operations**	**Specified value**	**Corrective action**
16	-	Function of ABS warning light -K47-	• Ignition off		• Check wire from terminal 4 via fuse -S9- to ignition switch.
			• Switch ignition on.	ABS warning light -K47- lights up for 2 seconds and goes out again	• Check wire from terminal 16 (control module) to terminal T32/19 (instrument cluster) for open circuit. • Check wire from terminal T32/19 (instrument cluster) to Ground (GND). • Malfunction in instrument cluster.

FUNCTIONAL CHECK: ABS HYDRAULIC PUMP -V64-

Functional check: ABS hydraulic pump -V64-					
Test step	**VAG1598 sockets**	**Test of**	• **Test conditions** • **Additional operations**	**Specified value**	**Corrective action**
17	-	Function of ABS hydraulic pump -V64-	• Ignition off • Pull hydraulic pump harness connector T2 off control module.		

			• Connect Ground (GND) and T2/2 battery voltage to hydraulic pump T2/1 harness connector.	Hydraulic pump runs without error (max. 10 secs.)	• Perform output Diagnostic Test Mode (DTM), see **OUTPUT DIAGNOSTIC TEST MODE (FUNCTION 03)** . • Replace control module.
				Hydraulic pump does not run	• Replace hydraulic unit.

CHECKING CAN-BUS WIRE

Checking CAN-bus wire					
Resistance test - switch to 200 ohm measuring range					
Test step	**VAG1598 sockets**	**Test of**	• **Test conditions** • **Additional operations**	**Specified value**	**Corrective action**
18	11 +10 10 + 8 10 + 24 11 + 8 11 + 24	CAN-bus	• Ignition off • ABS control module harness connector connected • Do not disconnect T10A. • Using VW1594, connect T10A terminal 2 and terminal 1 to multimeter (Fluke 83 or equivalent).	50.0 - 70.0 ohm	• Check wiring according to wiring diagram. • Disconnect all connectors from control modules. • Connect each control module separately. • Only two control modules can each have a terminating impedance of 120 ohms. • Either a third control module is attached with a terminating impedance or a control module is malfunctioning.
18 (Cont.)	11 +10 10 + 8 10 + 24 11 + 8 11 + 24	CAN-bus	Ignition Off	greater than 300 ohms	Check for short circuit to ground. Repair Accordingly.

CHECKING CAN-BUS WIRE

Checking CAN-bus wire					
Voltage test - switch to 20V DC measuring range					
			• **Test conditions**		

Test step	VAG1598 sockets	Test of	• Additional operations	Specified value	Corrective action
19	10 + 9 10 + 4 10 + 25 11 +9 11 + 4 11 + 25	CAN-bus wiring (short circuit to B+)	• Ignition on	less than 6 V	• Check for short circuit to battery to wiring diagram; repair accordingly

SWITCH TO MEASURING RANGE: RESISTANCE MEASUREMENT (200 ohm/20 M ohm)

Switch to measuring range: Resistance measurement (200 ohm/20 M ohm)					
Test step	**V.A.G 1598 sockets**	**Item tested**	• **Test conditions** • **Additional operations**	**Specified value**	**Corrective action**
19	11+10	CAN-bus wiring	• Ignition switched off • Set to measuring range 200 ohm		
			• Disconnect multi-pin connection from a control module which is connected via data bus wiring:		
			• Connect test box V.A.G 1598/21		
			• Check data bus wiring for open circuit	max. 1.5 ohm	• Check wiring using wiring diagram.
19		CAN-bus wiring	• Set to measuring range 20 M ohm		
			• Remove fuse S9		
			• Check wiring for short circuit to positive or earth	Infinite Ohms	
					• Check wiring using wiring diagram

SWITCH TO MEASURING RANGE: RESISTANCE MEASUREMENT (200 ohm/20 M ohm)

Switch to measuring range: Resistance measurement (200 ohm/20 M ohm)					
Test step	**V.A.G 1598 sockets**	**Item tested**	• **Test conditions** • **Additional operations**	**Specified value**	**Corrective action**
20	-	Longitudinal acceleration	• Ignition switched off • Select 200 ohm measuring range		

		sensor -G251- wiring	• Disconnect connector for longitudinal acceleration sensor -G251-		
			• Disconnect multi-pin connector T25 from control module (w/EDL) -J104-		
			• Connect test box V.A.G 1598/21		
			• Check wiring between multi-pin connector for longitudinal acceleration sensor -G251- and multi-pin connector for control module (w/EDL) -J104- for open circuit	max. 1.5 ohm	• Check wiring using wiring diagram
			• Set to measuring range 20 M ohm		
			• Remove fuse S9		
			• Check wiring for short circuit to positive or Ground	ohm	
					• Check wiring using wiring diagram

FUNCTIONAL CHECK: WARNING LIGHT FOR BRAKE SYSTEM K118

Functional check: Warning light for brake system -K118					
Test step	**V.A.G 1598 sockets**	**Item tested**	• **Test conditions** • **Additional operations**	**Specified value**	**Corrective action**
21	-	Function of warning light for brake system -K118-	• Brake fluid level is OK. • Switch ignition on	Warning light for brake system -K118- lights up for approx. 2 seconds and goes out again	• Check brake fluid level warning switch -F34- in sealing cap
			• Pull connectors off both front speed sensors • Start engine and run at more than 2000 RPM	Warning light for brake system -K118- lights up and 3 warnings are sounded	• Check wiring using wiring diagram
					• Malfunction in

					instrument cluster
			• Reconnect connectors to both front speed sensors again • Check DTC memory and erase		

FUNCTIONAL CHECK: ESP CONTROL LAMP -K155

Functional check: ESP Control lamp -K155					
Test step	**V.A.G 1598 sockets**	**Item tested**	• **Test conditions** • **Additional operations**	**Specified value**	**Corrective action**
22	-	Function of ASR/ESP control lamp -K155-	• Switch ignition on	ASR/ESP control lamp -K155- lights up for 2 seconds and goes out again	
					• Check wiring using wiring diagram
					• Malfunction in instrument cluster

BRAKE LIGHT SWITCH, ADJUSTING

Vehicle up to m.y. 02.00

See **BRAKE LIGHT SWITCH** .

NOTE: Remove brake light switch to adjust.

- Remove driver's side storage compartment.
- Pull harness connector off brake light switch.
- Remove brake light switch by turning 90° clockwise.
- Pull brake light switch plunger fully out.
- Press brake pedal down as far as possible by hand.
- Guide brake light switch through assembly opening and reinstall by turning 90° to left.
- Release brake pedal.

- Install brake light switch harness connector.
- Reinstall driver's side storage tray.
- Operate brake pedal.

  Both brake lights light up.

- Take foot off brake pedal.

  Both brake lights must not light up.

Vehicle from m.y. 03.00

- Pull out brake light switch plunger to full extension.
- Keep brake pedal in up position (IMPORTANT! hold pedal up if necessary while installing switch).
- Guide switch through mounting hole (only fits in one position).
- Seat switch fully into opening (pressing plunger against pedal to adjust.
- Seat switch by turning it 45° clockwise. This action also turns the plunger shoe into the correct orientation to make electrical contracts in switch operate as well as locks in plunger adjustment.
- Connect brake light switch connector.
- Operate brake pedal to verify proper function.
- Reinstall lower cover panel.

ABS MARK 60 VEHICLES FROM M.Y. 10.00, ON BOARD DIAGNOSTIC (OBD)

The ABS system Mark 60 is available in three different versions.

- ABS
- ABS/EDL/ASR
- ABS/EDL/ASR/ESP with front wheel drive

Each version has its own control module. The control modules can be coded accordingly through coding bridges via tester VAS 5051 or V.A.G 1551.

The ESP (Electronic Stabilization Program) is an electronic dynamics Program (EDP). It stabilizes the vehicle when over steering or under steering. The ESP works over the whole speed range. If the ESP is regulating the system the ESP warning lamp will flash 3 times per second.

The ESP is a further extension of the familiar vehicle safety systems .

ESP increases control over the vehicle in critical situations. It reduces the danger of skidding and increases the steering control when compared with familiar vehicle safety systems.

FUNCTION

As the control modules are interconnected with a data bus wire, always start troubleshooting by checking Diagnostic Trouble Code (DTC) memories of all the control modules in the vehicle.

This occurs in "Automatic test sequence" and is activated with key function 00.

When doing this, check to see if there are DTCs stored which may influence the ABS.

The OBD relates to the electrical/electronic part of the ABS, i.e. only malfunctions via the electrical connection to the control module are recognized (e.g. speed sensor open circuit).

The 47-pin ABS Control Module (w/EDL) -J104- forms a compact assembly with the hydraulic unit. The unit is located on the left in the engine compartment. The control module is equipped with a DTC memory. The Data Link Connector (DLC) is located left of the steering column under the instrument panel. Only early production cars DLC is in the center console below the heating and air conditioning controls.

The control module recognizes malfunctions during vehicle operation and stores them in a permanent memory, the contents of which remain even during periods of no battery voltage.

Sporadic (irregular) malfunctions will also be recognized and stored. But if faults affecting the data bus system do not occur again within the next 15 vehicle start and driving off sequences, or other malfunctions within the next 50 vehicle start and driving off sequences, they will be erased from DTC memory except for the malfunction "Control module faulty" (forget-malfunction counter).

After the ignition is switched on and/or the engine is started, the ABS warning light -K47- and the ASR/ESP control lamp -K155- will light up for approx. 2 seconds.

During this period a test sequence (self-check) is run in the control module for the following functions:

- To check if the supply voltage is at least 10.0 Volt,
- To check control module including the valve windings,
- To check the coding of the control module,
- A static check of the speed sensor (no speed signal),
- If the wheel speed signal is not OK after the car has been driven and a speed of approx. 20 km/h (approx. 13 mph) has been exceeded, the ABS warning light -K47- will light up again.

Special detail for bleeding brake systems with ABS/EDL

If a chamber in the brake fluid reservoir has run empty, basic setting must be performed for bleeding the brakes, see **Initiating basic setting** .

V.A.G 1551 scan tool or tester VAS 5051

The On Board Diagnostic must be initiated at the commencement of troubleshooting. Electrical malfunctions which influence the braking characteristics will be stored.

They can be checked with the V.A.G 1551 scan tool, Vehicles system tester VAG 1552 or Vehicle Diagnosis, Testing and Information System VAS 5051.

As a minimum requirement, program card level 9.0 must be installed in V.A.G 1551 scan tool and program card level 6.0 installed in vehicle systems tester VAG 1552.

APPLICATION OF ABS MARK 60

The brake booster boost is produced by vacuum pressure.

Distinguishing features:

1. 10" brake booster
2. Hydraulic unit
3. Control unit, 47-pin (bolted to hydraulic unit). Two 4.8 mm wide contacts are located at each end of the connection.

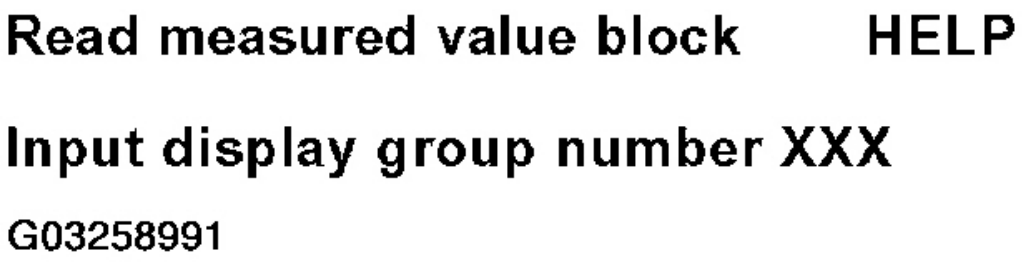


Fig. 147: Identifying Distinguishing Features (ABS MARK 60)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

TECHNICAL DATA

Control module identification

The control module version is displayed when scan tool V.A.G 1551 or tester VAS 5051 is connected and the brake electronics control module is selected, see **ON BOARD DIAGNOSTIC (OBD), PERFORMING** .

1C0 907 379 C/J/L ABS for vehicles from my 10.00

1C0 907 379 E ABS/EDL for vehicles up to 09.00

1C0 907 379 D/K ABS/EDL/ASR for vehicles from my 10.00

1C0 907 379 ABS/EDL/ASR/ESP for vehicles up to my 09.00

1C0 907 379 E/G/M ABS/EDL/ASR/ESP for vehicles from my 10.00

Trouble Code (DTC) memory

A non-volatile memory ensures that the contents of the DTC memory are retained even without a voltage supply.

Data output

Data output is transmitted with V.A.G 1551 scan tool in operating mode 1 (Rapid data transfer), and with tester VAS 5051 in operating mode vehicle OBD.

SAFETY PRECAUTIONS AND FUNDAMENTAL POINTS REGARDING TROUBLESHOOTING

NOTE:

- **The ABS is a vehicle safety system; the appropriate knowledge is necessary to work on the system.**
- **In order to check complaints and to be able to carry out pin-pointed troubleshooting, the Diagnostic Trouble Code DTC memory must be checked before commencing work on the ABS system.**
- **Only separate connectors when the ignition is switched off.**
- **Observe the appropriate instructions regarding the handling of brake fluid.**
- **ABS malfunctions are indicated by the ABS warning light illuminating. Certain malfunctions will only be recognized at speeds above 20 km/h (approx. 13 mph) (carry out road test).**
- **If the ABS warning light -K47- and the Warning light for brake system -K118- warning lights do not illuminate, but the brake system is not functioning correctly then the malfunction must be sought in the conventional braking system. See DISC .**

TROUBLESHOOTING WITH V.A.G 1551 SCAN TOOL OR TESTER VAS 5051 ON ABS MARK 60 (FLOW CHART)

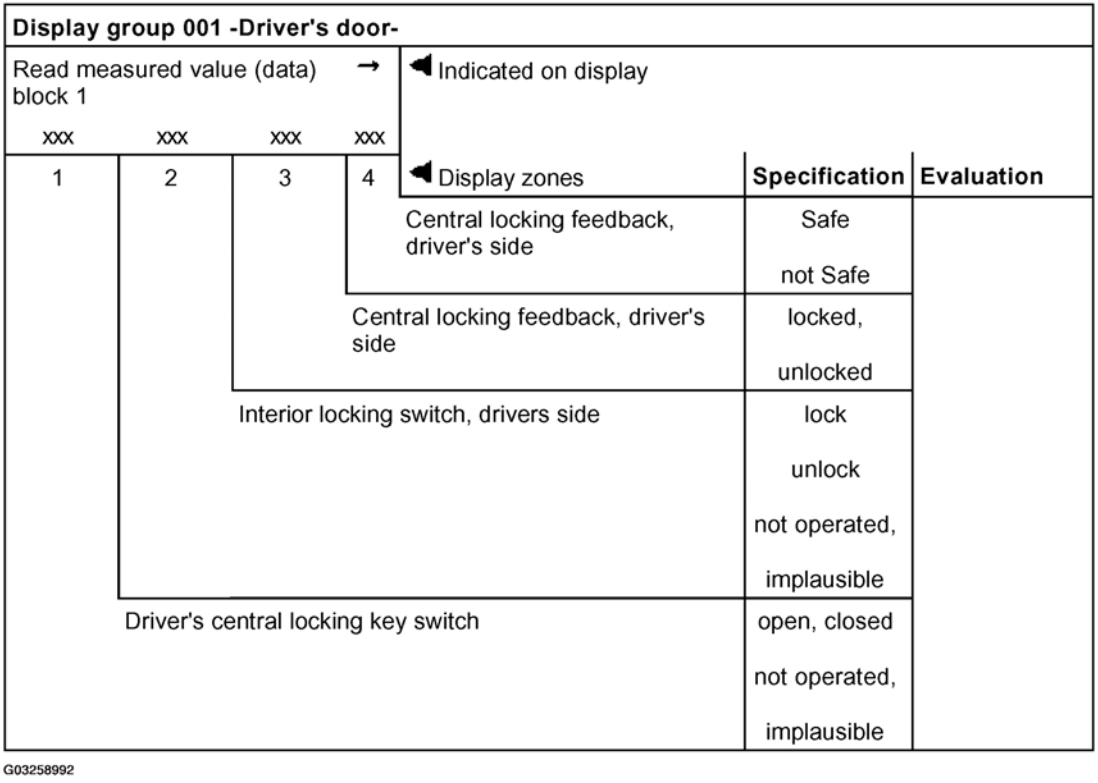


Fig. 148: Troubleshooting With V.A.G 1551 Scan Tool Or Tester VAS 5051 On ABS Mark 60 - Flow Chart (1 Of 2)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

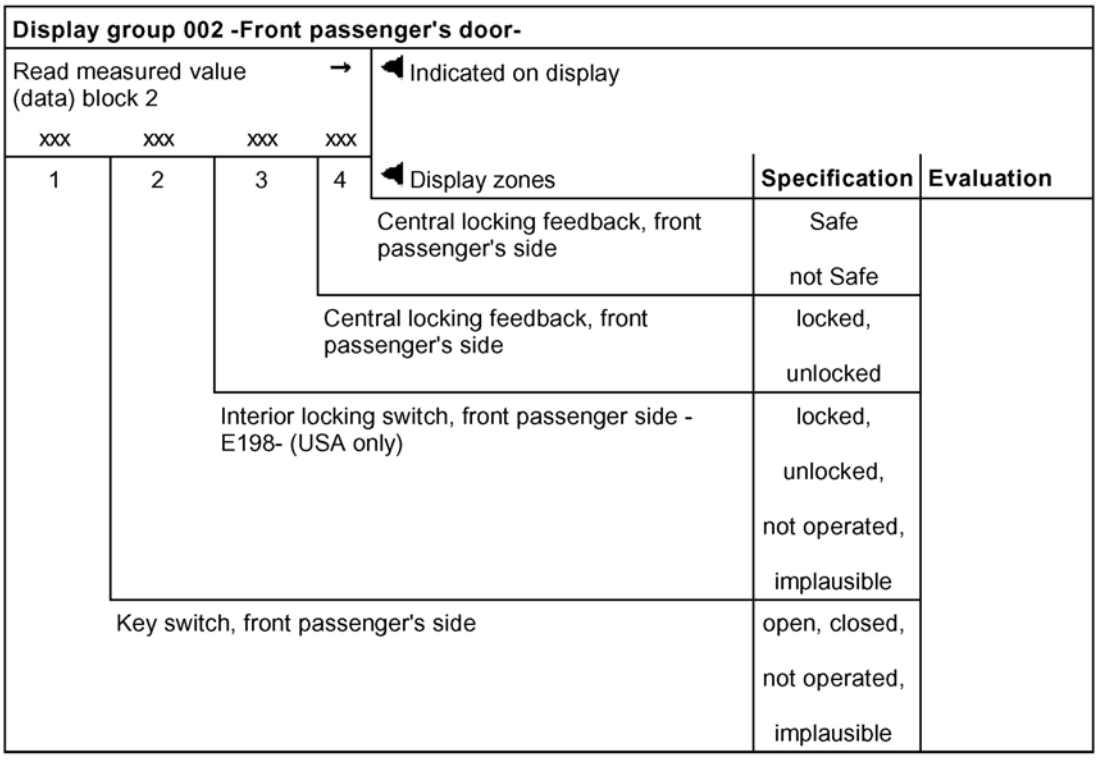


Fig. 149: Troubleshooting With V.A.G 1551 Scan Tool Or Tester VAS 5051 On ABS Mark 60 - Flow Chart (2 Of 2)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

ELECTRICAL/ELECTRONIC COMPONENTS AND INSTALLING LOCATIONS

NOTE: The following list refers to items in Fig. 150 .

1. **ABS hydraulic unit -N55-**
   - Located on left of engine compartment.
   - The ABS hydraulic pump -V64- and the inlet/outlet valves in the hydraulic unit are checked by On Board Diagnostic (OBD)
   - The ABS hydraulic pump -V64- and valve block must NOT be separated from one another
   - Removing and installing

     See **HYDRAULIC UNIT, BRAKE BOOSTER/BRAKE MASTER CYLINDER ASSEMBLY OVERVIEW MARK 60** ; **CONTROL MODULE AND HYDRAULIC UNIT, REMOVING AND INSTALLING** .

   - When changing the hydraulic unit, always seal the old part with the plugs from the repair set Part No. 1 H0 698 311 A

2. **ABS Control Module (w/EDL) -J104-**
    - Location: on hydraulic unit on left of engine compartment
    - Checked by On Board Diagnostic (OBD)
    - Checking the multi-pin connector to control module, see **MULTI-PIN CONNECTOR WITH CONTACT ASSIGNMENTS**
    - Do not disconnect multi-pin connector before successfully completing OBD. Switch ignition off before separating connection.
    - Removing and installing

      See **HYDRAULIC UNIT, BRAKE BOOSTER/BRAKE MASTER CYLINDER ASSEMBLY OVERVIEW MARK 60** ; **CONTROL MODULE AND HYDRAULIC UNIT, REMOVING AND INSTALLING** .

      Vehicles with ABS/ESP only

    - When the ABS Control Module (w/EDL)-J104- is replaced, a zero compensation must be performed
    - Initiate basic settings, see **INITIATING BASIC SETTING** Perform display group numbers 060, 063 and 066
3. **Brake light switch -F-**
    - The brake light switch is open in the rest position;
    - Adjusting, see **ADJUSTING BRAKE LIGHT SWITCH**
    - Can be checked via read measured value block, see **MEASURED VALUE BLOCK, READING**
4. **Sender for rotation rate -G202-**
    - Vehicles with ABS/EDL/ASR/ESP only
        - Location: Under instrument panel next to steering column
        - Checked by OBD
        - Can be checked via read measured value block, see **MEASURED VALUE BLOCK, READING**
        - Observe installation instructions

          See **ESP SYSTEM COMPONENTS, REMOVING AND INSTALLING** .

5. **Sensor for transverse acceleration -G200-**
    - Vehicles with ABS/EDL/ASR/ESP only
        - Location: Under instrument panel next to steering column
        - Checked by OBD
        - Can be checked via read measured value block, see **MEASURED VALUE BLOCK, READING**
        - Observe installation instructions

See **ESP SYSTEM COMPONENTS, REMOVING AND INSTALLING** .

- When the sensor for transverse acceleration -G200- is replaced, a zero compensation must be performed
- Initiate basic setting, see **INITIATING BASIC SETTING** , perform display group number 063

6. **ESP-Sensor unit -G419-, vehicles from my 12.01**
   - Vehicles with ABS/EDL/ASR/ESP only
     - Combined sensor for transverse acceleration -G200- and sender for rotation rate -G202-
     - Assembled together in one housing
     - Checked by OBD
     - Can be checked via read measured value block, see **MEASURED VALUE BLOCK, READING**
     - Observe installation instructions

       See **ESP SYSTEM COMPONENTS, REMOVING AND INSTALLING** .

     - When the ESP-sensor unit -G419- is replaced, a zero compensation must be performed
     - Initiate basic setting, see **INITIATING BASIC SETTING** , perform display group number 063
7. **Brake system vacuum pump -V192-**
   - Not installed in all vehicles
   - Location: left of subframe
   - Checked by On Board Diagnostic (OBD) in engine control module
   - Removing and installing. See **VACUUM PUMP (DIESEL MODELS)** .
   - Checking

     See **ELECTRIC VACUUM PUMP** .

8. **Brake booster**
9. **Steering angle sensor -G85-**
   - Vehicles with ABS/EDL/ASR/ESP only
     - Location: On steering column between steering wheel and steering column switch.
     - Checked by On Board Diagnostic (OBD)
     - Can be checked via read measured value block, see **MEASURED VALUE BLOCK, READING** .
     - Observe installation instructions

       See **ESP SYSTEM COMPONENTS, REMOVING AND INSTALLING** .

- When the steering angle sensor -G85- is replaced, a zero compensation must be performed
- Introduce basic setting, see **INITIATING BASIC SETTING** , perform display group number 060

10. **Sender 1 for brake booster -G201-**
    - Vehicles with ABS/EDL/ASR/ESP only
        - Checked by OBD
        - Can be checked via read measured value block, see **MEASURED VALUE BLOCK, READING**
        - Removing and installing

          See **HYDRAULIC UNIT, BRAKE BOOSTER/BRAKE MASTER CYLINDER - ASSEMBLY OVERVIEW MARK 60** .

        - When the sender 1 for brake booster -G201- is replaced, a zero compensation must be performed
        - Initiate basic setting, see **INITIATING BASIC SETTING** , perform display group number 066
11. **Warning light for brake system -K118-**
    - Location: In the instrument cluster

      Function:, see **DIAGNOSIS TROUBLE CODES (DTCS) DISPLAYED BY WARNING LIGHTS -K47-, -K118- AND -K155-**

12. **ABS warning light -K47-**
    - Location: In the instrument cluster

      Function:, see **DIAGNOSIS TROUBLE CODES (DTCS) DISPLAYED BY WARNING LIGHTS -K47-, -K118- AND -K155-** .

13. **Right/left rear ABS wheel speed sensor -G44-/-G46-**
    - Checked by OBD
    - Before inserting the sensor clean the inner surface of the sensor mounting and coat with lubricating paste G 000 650
    - When connecting the speed sensor wire make sure it is not twisted in the wheel housing
    - Tightening torque of bolt: 10 N.m (7.4 ft lb)
14. **ESP control lamp -K155-**
    - Location: In the instrument cluster

      Function:, see **DIAGNOSIS TROUBLE CODES (DTCS) DISPLAYED BY WARNING LIGHTS -K47-, -K118- AND -K155-** .

15. **Wheel hub with rotor for speed sensors**

- Rotor and speed sensors for rear left and right-hand sides are identical
- Removing and installing

  For rear suspension, see **WHEEL BEARING** .

16. **Wheel hub with rotor for speed sensors**
    - Rotor and speed senders for front left and right-hand sides are identical
    - Removing and installing

      For front suspension, see **WHEEL BEARING (WHEEL BEARING HOUSING INSTALLED)** .

17. **Right/left front ABS wheel speed sensor -G45- / -G47-**
    - Checked by OBD
    - Before inserting the sensor clean the inner surface of the sensor mounting and coat with lubricating paste G 000 650
    - When connecting the speed sensor wire make sure it is not twisted in the wheel housing
    - Tightening torque of bolt: 10 N.m (7.4 ft lb)
18. **Data Link Connector (DLC)**
    - Location: on left below drivers stowage compartment

Display group 003 -Rear doors-

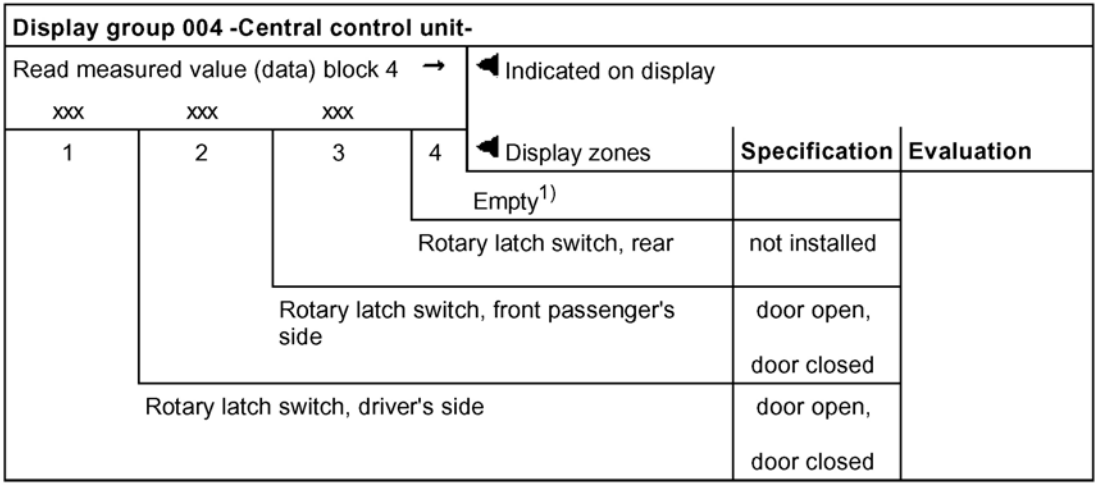
Read measured value (data) block 3 →				◀ Indicated on display		
xxx	xxx	xxx	xxx			
1	2	3	4	◀ Display zones	**Specification**	**Evaluation**
				Central locking feedback, RL	not installed	
				Central locking feedback, RL	not installed	
				Central locking feedback, RR	not installed	
				Central locking feedback, RR	not installed	

G03258994

Fig. 150: Identifying Electrical/Electronic Components And Installing Locations (ABS Mark 60)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

DIAGNOSIS TROUBLE CODES (DTCS) DISPLAYED BY WARNING LIGHTS - K47-, -K118- AND -K155-

WARNING LAMPS



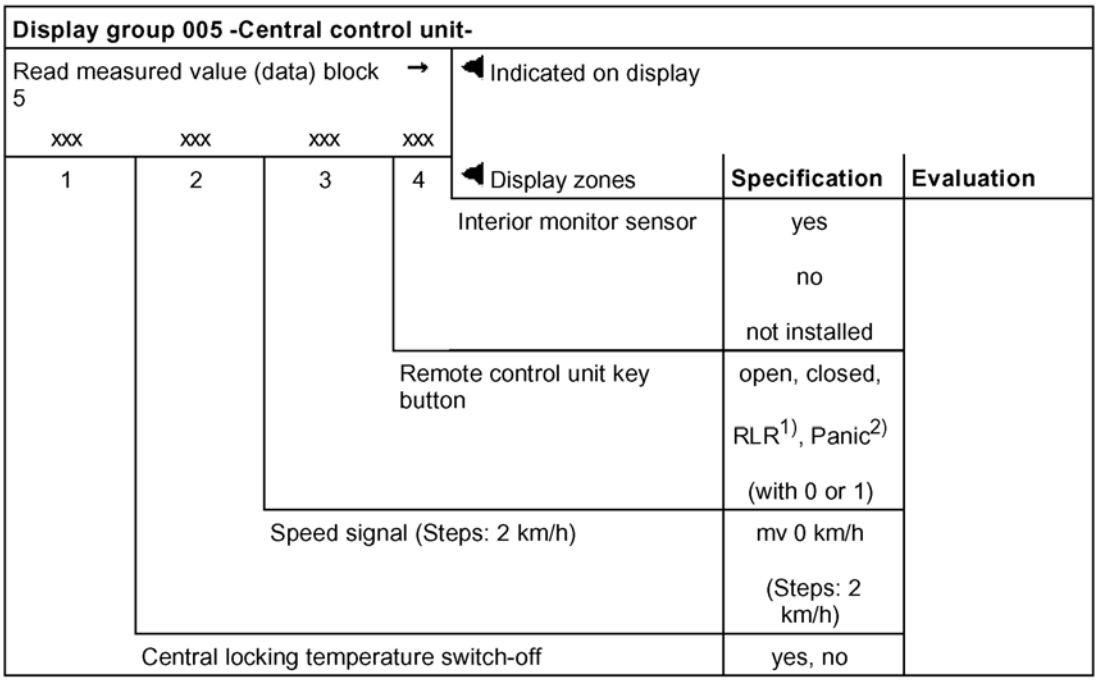
Display group 004 -Central control unit-						
Read measured value (data) block 4 →				◀ Indicated on display		
xxx	xxx	xxx				
1	2	3	4	◀ Display zones	**Specification**	**Evaluation**
				Empty[1)]		
				Rotary latch switch, rear	not installed	
				Rotary latch switch, front passenger's side	door open, door closed	
				Rotary latch switch, driver's side	door open, door closed	

[1)] Empty means in this case: Display zone is blank

G03258995

Fig. 151: Locating Warning Lamps For K47, K118 And K155
Courtesy of VOLKSWAGEN OF AMERICA, INC.

ABS WARNING LIGHT -K47-



Display group 005 -Central control unit-						
Read measured value (data) block 5 →				Indicated on display		
xxx	xxx	xxx	xxx			
1	2	3	4	Display zones	Specification	Evaluation
				Interior monitor sensor	yes no not installed	
				Remote control unit key button	open, closed, RLR[1], Panic[2] (with 0 or 1)	
				Speed signal (Steps: 2 km/h)	mv 0 km/h (Steps: 2 km/h)	
				Central locking temperature switch-off	yes, no	

[1] Only vehicles for USA, RLR= Rear lid Remote release

[2] Only vehicles for USA, alarm system and turn signal lights are activated

G03258996

Fig. 152: Locating ABS Warning Light K47
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- If the ABS warning light -K47- -1- does not go out after switching the ignition on and completion of the test sequence, the malfunction may be:

  -a- Voltage supply is below 10 Volt

  -b- There is a malfunction in the ABS

  The anti-locking brake system remains switched off with an ABS malfunction -b-, but the brake system remains fully operational.

  Check Diagnostic Trouble Code (DTC) memory, see **DIAGNOSTIC TROUBLE CODE (DTC) MEMORY, CHECKING** .

  -c- Since the last time the vehicle was started there was a temporary speed sensor malfunction.

  In the case of sensor malfunction -c- the ABS warning light -K47- will extinguish after restarting the engine and attaining a speed of above 20 km/h (approx. 13 mph).

  -d- The connection from instrument cluster to ABS Control Module (w/EDL) -J104- is interrupted (open

circuit).

-e- Instrument cluster is faulty.

WARNING LIGHTS -K47- AND -K118-

- If the ABS warning light -K47- -1- goes out but the warning light for brake system -K118- -2- remains on, then the malfunction may be:

  -a- The parking brake is applied.

  -b- There is a malfunction in the activation of the warning light for brake system -K118-, see wiring diagram.

  -c- The brake fluid level is too low.

- If the ABS warning light -K47- -1- and the warning light for brake system -K118- -2- illuminated, the ABS system is faulty and the EBD (electronic brake pressure distribution) is not functioning.

  WARNING: After the ABS warning light -K47- and warning light for brake system -K118- have illuminated, it is possible that the rear wheels will lock-up earlier when braking.

ESP CONTROL LAMP -K155-

Display group 006 -Central control unit-

Read measured value (data) block → 6				◀ Indicated on display		
xxx	xxx	xxx	xxx			
1	2	3	4	◀ Display zones	**Specification**	**Evaluation**
				Ignition	Terminal 15 on, Terminal 15 off	
				Tailgate key switch	open, closed, not operated implausible	
				Key number[1)]	0,1, 2, 3, 4	
				S-terminal	operated, not operated	

[1)] Display 1 for remote control key 1 is performed by operating a button on remote control key

G03258997

Fig. 153: Locating ESP Control Lamp K155
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- If the ESP Control Lamp -K155- -3- does not go out after the ignition is switched on and test sequence is completed then the malfunction may be:

  Check Diagnostic Trouble Code (DTC) memory, see **DIAGNOSTIC TROUBLE CODE (DTC) MEMORY, CHECKING** .

  -a- Short to positive in ASR/ESP button -E256-

  -b- There is a malfunction in the activation of the ESP Control Lamp -K155-.

  -c- The ASR/ESP system has been switched off via ASR/ESP button -E256-.

There is a malfunction present which only affects the safety systems of the ASR/ESP. The ABS/EDL and EBD safety systems on the vehicle remain fully functional.

If ESP control lamp -K155- flashes while driving, the ASR or ESP system is regulating the system.

ON BOARD DIAGNOSTIC (OBD), PERFORMING

NOTE: This On Board Diagnostic (OBD) is for the ABS MARK 60 system.

SCAN TOOL, CONNECTING

All functions which could previously be performed with V.A.G 1551/1552 can also be performed with the new tester VAS 5051 in the operating mode vehicle OBD.

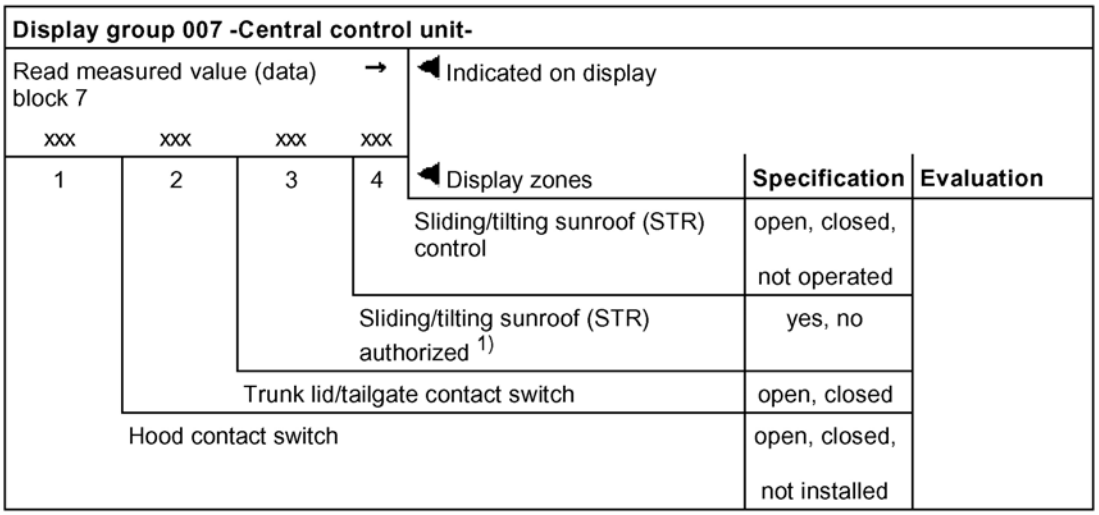
See .

NOTE:

- **The ABS function is switched off in the control module during the On Board Diagnostic (OBD).**
- **The Diagnostic Trouble Code (DTC) memory must be erased after a successfully checking and repair.**

SPECIAL TOOLS AND EQUIPMENT

- VAS 5051 Vehicle Diagnosis, Testing and Information System
- Diagnosis cable VAS 5051/1 or VAS 5051/3



1) The control unit sends a "switch-off delay" terminal 15 to sliding/tilting sunroof. Therefore the operation of the sliding/tilting sunroof is still possible, after switching off the ignition, and until a door is opened.

G03258998

Fig. 154: Identifying VAS 5051 Vehicle Diagnosis, Testing And Information System
Courtesy of VOLKSWAGEN OF AMERICA, INC.

TEST PREREQUISITES FOR OBD

- The tires installed to all wheels must be of the same (approved) size; tires inflated to prescribed pressure.
- Mechanical/hydraulic parts of the brake system including brake light switch and brake lights OK.
- Hydraulic connections and lines are not leaking (visual check of hydraulic module, brake calipers, wheel cylinders, tandem brake master cylinder).
- Wheel bearings and wheel bearing play are OK.
- ABS Control Module (w/EDL) -J104- is correctly bolted to hydraulic unit -N55-.
- Electrical connection is installed correctly to the ABS Control Module (w/EDL) -J104- (locking device is engaged correctly).
- Check electrical connections of ABS components for damage and correct seating.
- All fuses, according to wiring diagram OK. (remove fuse from holder to check).
- Supply voltage OK. (at least 10.0 V)
- Access to the OBD is only possible when the vehicle is stationary and ignition turned on (or engine running).
- When checking the ABS system make sure that the vehicle electric system is not affected by electromagnetic interference, i.e. the vehicle is kept well away from equipment with a high current draw, e.g. from an electric welding module.

SAFETY PRECAUTIONS

WARNING:

- **You must always secure testing and measuring equipment on the rear seat.**
- **When vehicle is being driven, only a second technician operate this equipment.**

SCAN TOOL CONNECTING

All functions which could previously be performed with V.A.G 1551/1552 can also be performed with the new tester VAS 5051 in the operating mode vehicle OBD.

Connecting VAS 5051

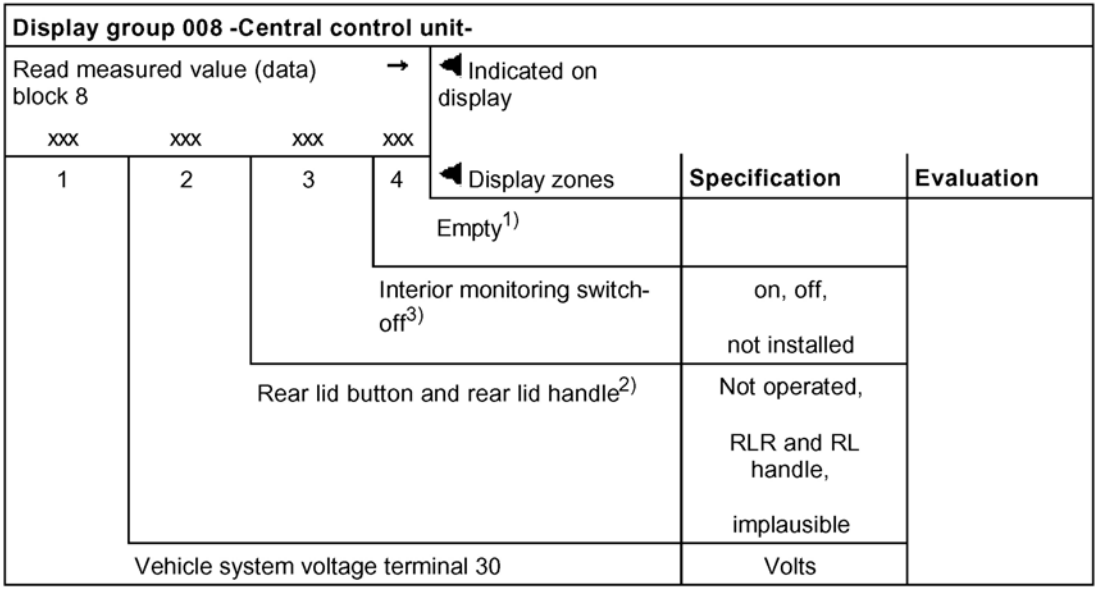
- With ignition switched off, connect tester VAS 5051 to Data Link Connector using diagnosis cable VAS 5051/1 or VAS 5051/3.

Selecting operating mode:

- Press button on display for "Vehicle OBD".

Selecting vehicle system:

- Press "03 - Brake electronics" on display.



Display group 008 -Central control unit-						
Read measured value (data) block 8 →				Indicated on display		
xxx	xxx	xxx	xxx			
1	2	3	4	Display zones	Specification	Evaluation
				Empty[1]		
				Interior monitoring switch-off[3]	on, off, not installed	
				Rear lid button and rear lid handle[2]	Not operated, RLR and RL handle, implausible	
				Vehicle system voltage terminal 30	Volts	

[1] Empty means in this case: Display zone is blank

[2] Rear lid remote unlocking button, rear lid handle

[3] Interior monitoring switch-off

G03258999

Fig. 155: Connecting Tester VAS 5051 To Data Link Connector Using Diagnosis Cable VAS 5051/1 or VAS 5051/3
Courtesy of VOLKSWAGEN OF AMERICA, INC.

The control module identification and coding are indicated on the display.

Selecting diagnosis function:

All diagnostic functions available are indicated on the display.

- Press button on display for desired function.
- Further measures see repair procedures.

NOTE: The following test sequences are for V.A.G 1551 scan tool.

V.A.G 1551 SCAN TOOL, CONNECTING AND SELECTING FUNCTION

NOTE:

- **All functions that have so far been carried out with V.A.G 1551 can now also be carried out with the tester VAS 5051.**

Special tools and equipment

- V.A.G 1551 scan tool

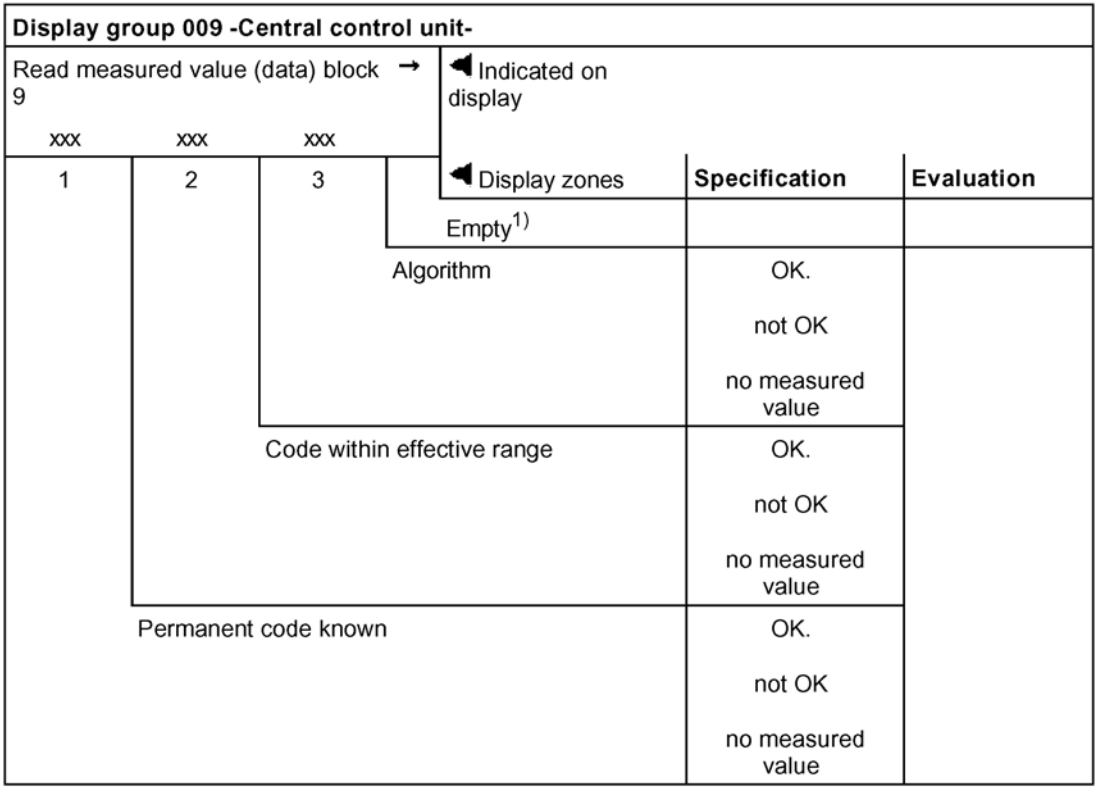


Fig. 156: Identifying V.A.G 1551 Scan Tool
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- V.A.G 1551/3 or 1551/3A adapter cable

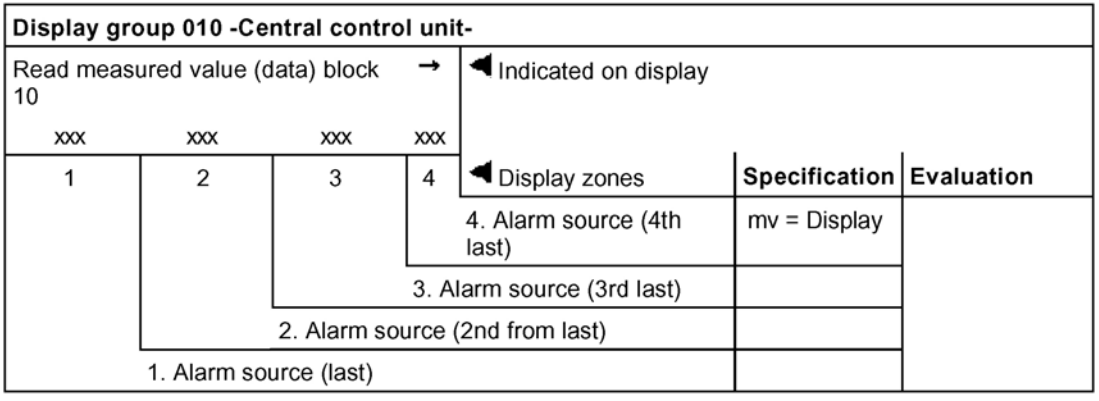


Fig. 157: Identifying V.A.G 1551/3 Or 1551/3A Adapter Cable
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Work sequence

- Connect V.A.G 1551 scan tool using cable V.A.G 1551/3.

NOTE:

- **If the display does not indicate as described in the work sequence:**

  See Scan tool operating instructions

- **If due to an input malfunction "Malfunction in the data transfer!" is displayed, disconnect wire off scan tool, reconnect and repeat work step.**

- Connect VAS 5051, see **ON BOARD DIAGNOSTIC (OBD), PERFORMING** .

Display group 011 -Central control unit-						
Read measured value (data) block 11 →				◄ Indicated on display		
xxx	xxx	xxx	xxx			
1	2	3	4	◄ Display zones	**Specification**	**Evaluation**
				Empty[1)]		
				Rear lid prelock catch[2)]	open, closed, not installed	
				Automatic- lock / unlock- switch	Not relevant	
				Immobilizer key recognition	yes, no, not installed	

[1)] Empty means in this case: Display zone is blank

[2)] Rotary latch of lock must be detent in the first stage

G03259002

Fig. 158: Connecting V.A.G 1551 Scan Tool Using Cable V.A.G 1551/3
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display: See **Fig. 159** .

[1)] Is displayed alternately

If the display remains blank, check Data Link Connector connection, Electrical check, see **ELECTRICAL TEST OF MARK 60, VEHICLES FROM M.Y. 10.00** , test steps 21 and 22.

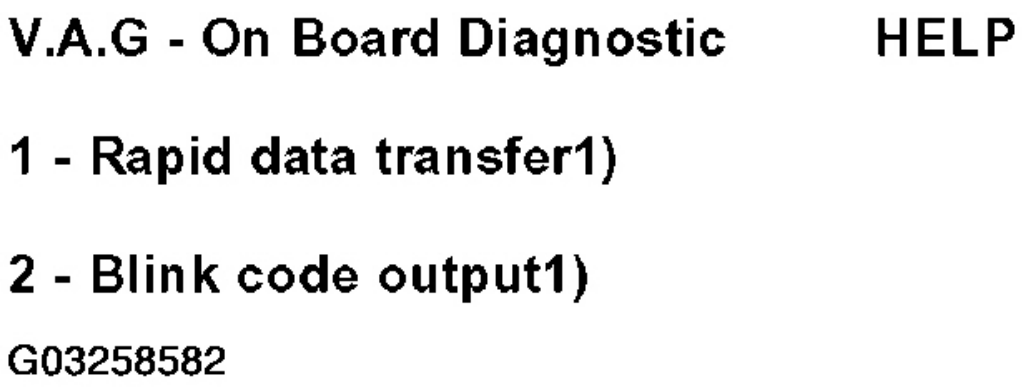


Fig. 159: V.A.G 1551 Scan Tool Display - Performing On Board Diagnostic (1 Of 8)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

NOTE:

- **Depending on the program, additional operating information can be printed out by pressing the HELP key of V.A.G 1551.**
- **The --> key is used for moving forward within the program**
- **The PRINT key is used for switching on the printer (warning lamp in key comes on).**

- Switch on ignition.
- Switch on printer with the Print key (indicator lamp in key lights up).
- Press key -1- for "Rapid data transfer" operating mode.

Indicated on display, see **Fig. 160** .

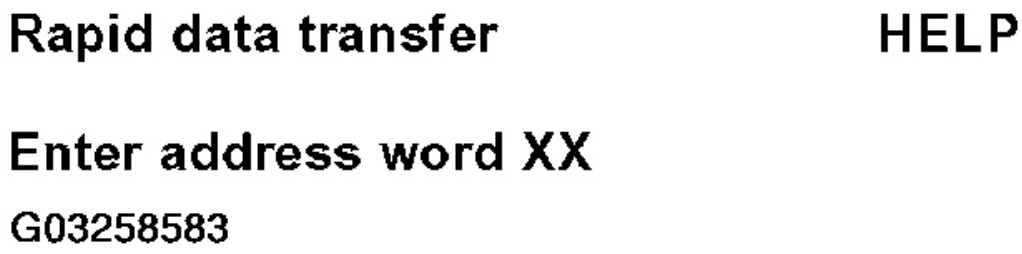


Fig. 160: V.A.G 1551 Scan Tool Display - Performing On Board Diagnostic (2 Of 8)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Press keys -0- and -3-; 03 to input address word of vehicle system to be tested: "Brake electronics".

Indicated on display: See **Fig. 161** .

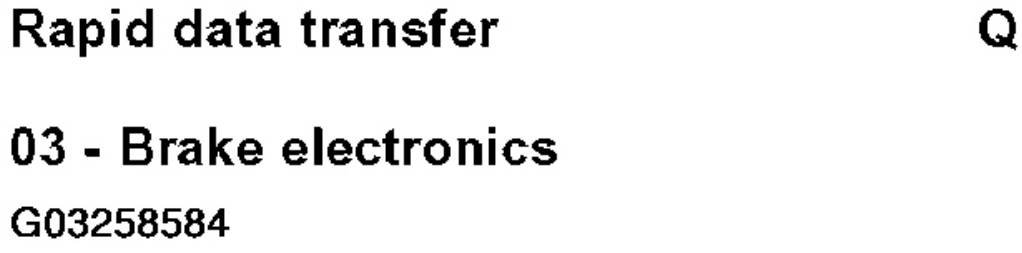


Fig. 161: V.A.G 1551 Scan Tool Display - Performing On Board Diagnostic (3 Of 8)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Confirm input with Q key.

And then the display shows e.g.: See **Fig. 162** .

Fig. 162: V.A.G 1551 Scan Tool Display - Performing On Board Diagnostic (4 Of 8)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Displayed is:

- The control module identification number.

  e.g. (1 C0 907 379 E)

  Application of control module

- See Parts catalog
- System designation (ESP).
- Type of drive (front wheel).
- ABS (Mark 60).
- Current coding of control module (0019970).

  Coding control module, see **ABS CONTROL MODULE, CODING** .

- Workshop code

  See *V.A.G 1551 scan tool operating instructions*

  If the control module identification number does not appear; see Summary of functions, see **LIST OF SELECTABLE FUNCTIONS** .

- Press --> key.

Indicated on display (Enter address word, e.g. 02 -Check DTC memory).

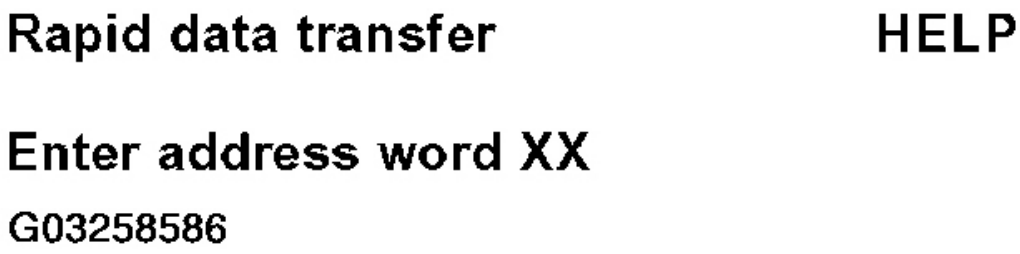


Fig. 163: V.A.G 1551 Scan Tool Display - Performing On Board Diagnostic (5 Of 8)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display:

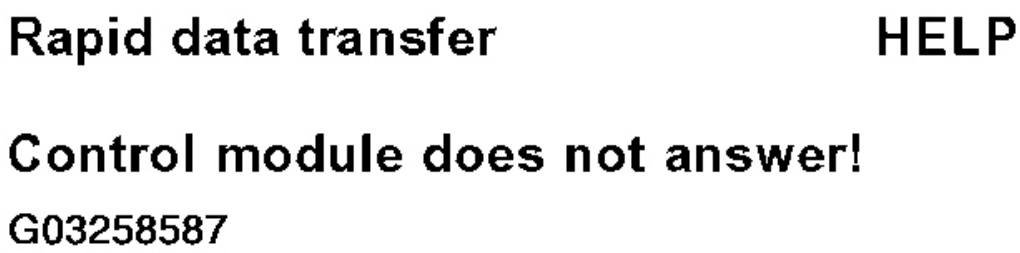


Fig. 164: V.A.G 1551 Scan Tool Display - Performing On Board Diagnostic (6 Of 8)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- By pressing the HELP key, a list of possible fault causes is printed out.
- After eliminating the possible causes of malfunctions, enter the address word 03 for "Brake electronics" again and confirm.

If "control module does not answer!" again appears:

Indicated on display:

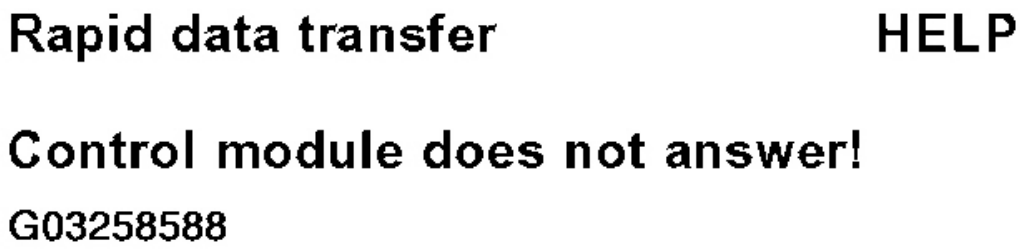


Fig. 165: V.A.G 1551 Scan Tool Display - Performing On Board Diagnostic (7 Of 8)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Perform test steps 1, 2 and 3, see **ELECTRICAL TEST OF MARK 60, VEHICLES FROM M.Y. 10.00** , Electrical check.

Control module identification influenced during checking (possibly influenced from external sources?)

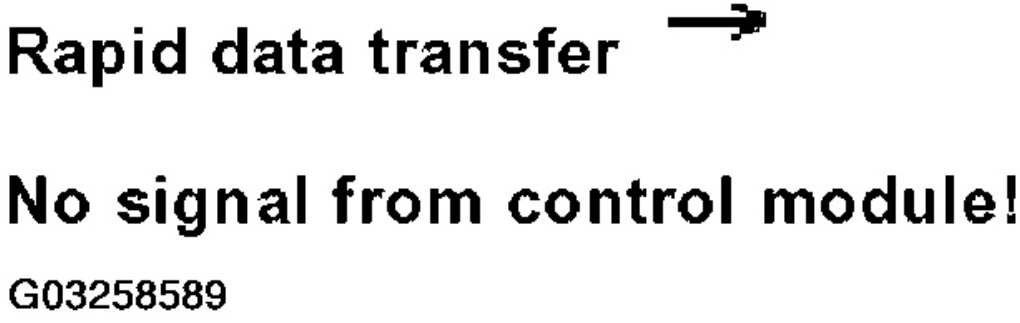


Fig. 166: V.A.G 1551 Scan Tool Display - Performing On Board Diagnostic (8 Of 8)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Check diagnostic wire as well as voltage supply and ground connection for ABS Control Module (w/EDL) -J104-, Electrical check, see **ELECTRICAL TEST OF MARK 60, VEHICLES FROM M.Y. 10.00** .
- After repairing the possible causes of the malfunction, again enter the address word 03 for "Brake electronics" and confirm with Q key.

LIST OF SELECTABLE FUNCTIONS

SELECTABLE FUNCTIONS LIST

		page
00 -	Automatic test sequence	See **AUTOMATIC TEST SEQUENCE**
01 -	Check control module version See connecting V.A.G 5051 scan tool and selecting function	See **ON BOARD DIAGNOSTIC (OBD), PERFORMING**
02 -	Check Diagnostic Trouble Code (DTC) memory	See **DIAGNOSTIC TROUBLE CODE (DTC) MEMORY, CHECKING**
03 -	Output Diagnostic Test Mode (DTM)	See **OUTPUT DIAGNOSTIC TEST MODE (DTM)**
04 -	Initiate basic setting	See **INITIATING BASIC SETTING**
05 -	Erase DTC memory	See **DIAGNOSTIC TROUBLE CODE (DTC) ERASING MEMORY, ENDING OUTPUT**
06 -	End output	See **DIAGNOSTIC TROUBLE CODE (DTC) ERASING MEMORY, ENDING OUTPUT**
07 -	Code control module	See **ABS CONTROL MODULE, CODING**
08 -	Read measured value block	See **MEASURED VALUE BLOCK, READING**
11 -	Login procedure	See **LOGIN PROCEDURE**

AUTOMATIC TEST SEQUENCE

The automatic test sequence checks all the Diagnostic Trouble Codes (DTC) memories of the control modules.

- Switch on ignition.

Indicated on display:

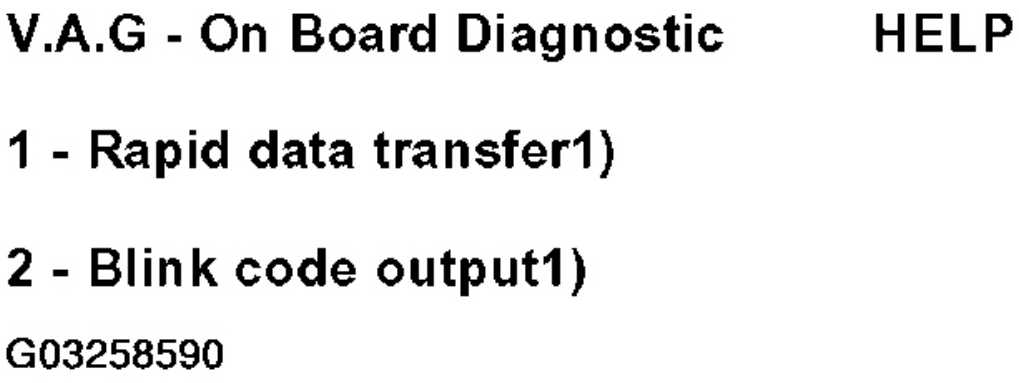


Fig. 167: V.A.G 1551 Scan Tool Display - Automatic Test Sequence (1 Of 3)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

1) Is displayed alternately

- Press key -1- for "Rapid data transfer" operating mode.
- Switch on printer with the Print key (indicator lamp in key lights up).

Indicated on display:

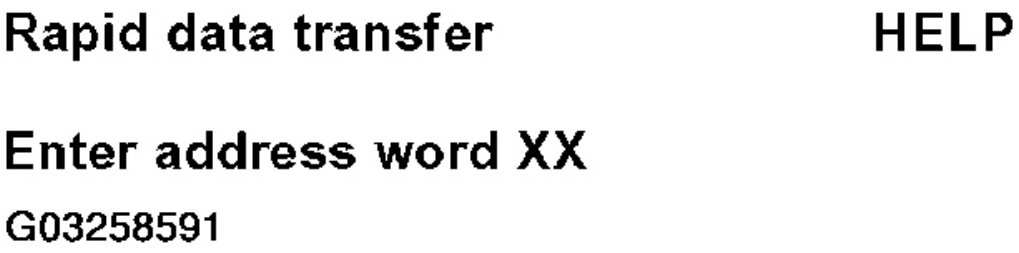


Fig. 168: V.A.G 1551 Scan Tool Display - Automatic Test Sequence (2 Of 3)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Press key -0- twice; 00 to enter "Check automatic test sequence" function.
- Confirm entry with Q key.

On display of V.A.G 1551 scan tool the engine control module identification will appear first e.g.

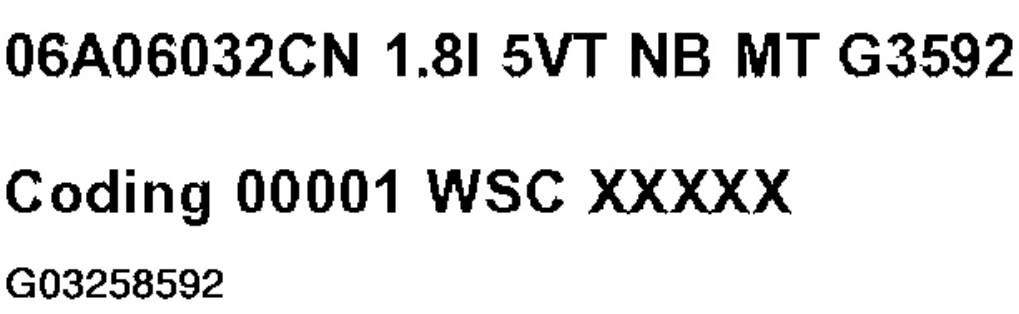


Fig. 169: V.A.G 1551 Scan Tool Display - Automatic Test Sequence (3 Of 3)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Thereafter all control module identifications with eventual DTC memory entries are displayed.

DIAGNOSTIC TROUBLE CODE (DTC) MEMORY, CHECKING

NOTE: All functions which could previously be performed with V.A.G 1551 can now also be carried out with the tester VAS 5051.

Indicated on display:

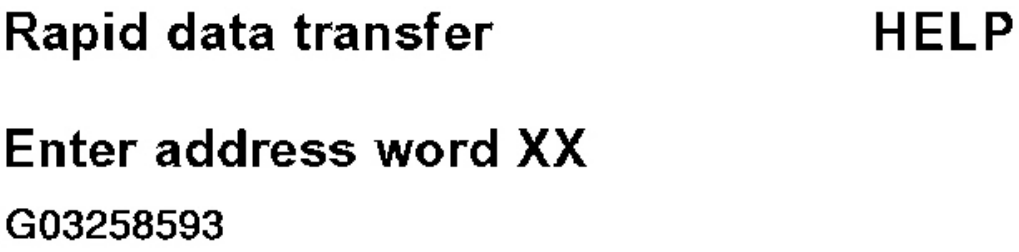


Fig. 170: V.A.G 1551 Scan Tool Display - Checking Diagnostic Trouble Code Memory (1 Of 4)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Press keys -0- and -2-; 02 enters the "Check DTC memory" function.

Indicated on display:

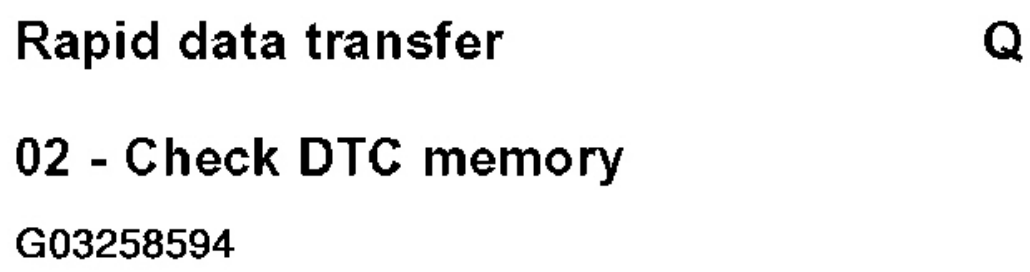


Fig. 171: V.A.G 1551 Scan Tool Display - Checking Diagnostic Trouble Code Memory (2 Of 4)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Confirm entry with Q key.

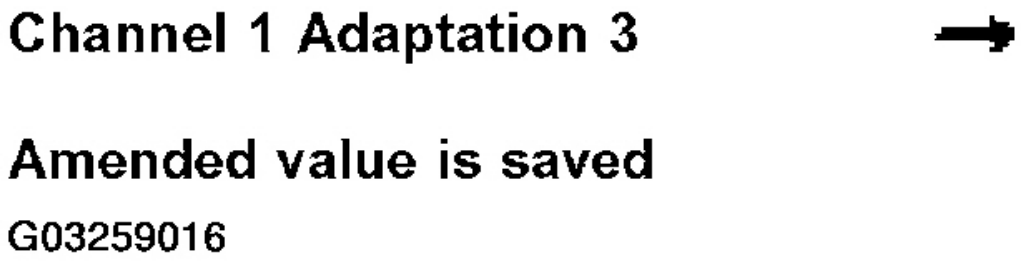


Fig. 172: V.A.G 1551 Scan Tool Display - Checking Diagnostic Trouble Code Memory (3 Of 4)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

The number of stored DTCs or "No DTC recognized" appears in the display.

- Press --> key.

  The stored DTCs are displayed and printed out one after the other.

- With DTC information print-out, eliminate malfunction according to DTC table, see **DIAGNOSTIC TROUBLE CODE (DTC) TABLE** .

As with "No DTC recognized", the program returns to the start position after pressing the --> key:

Indicated on display:

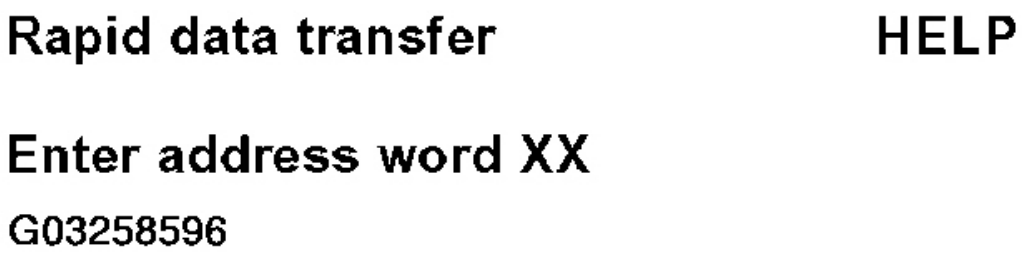


Fig. 173: V.A.G 1551 Scan Tool Display - Checking Diagnostic Trouble Code Memory (4 Of 4)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- End output (Function 06), see **DIAGNOSTIC TROUBLE CODE (DTC) ERASING MEMORY, ENDING OUTPUT** .
- Switch off ignition and unplug diagnostic connector.

Work sequence if a DTC has been recognized:

1. Repair malfunction according to DTC table, see **DIAGNOSTIC TROUBLE CODE (DTC) TABLE**
2. Check DTC memory (Function 02)
3. Erase DTC memory (Function 05)
4. End output (Function 06)
5. Perform a test drive
6. Check DTC memory again

DIAGNOSTIC TROUBLE CODE (DTC) TABLE

NOTE:

- **When beginning On Board Diagnostic (OBD) troubleshooting of the vehicle control modules, always start with function "Automatic test sequence" by pressing keys 0 and 0 because the control modules are interconnected with a data bus wire. This checks the DTC memories of the control modules in the vehicle.**
- **All the possible DTCs which can be recognized by the ABS Control Module (w/EDL) -J104- and printed-out on V.A.G 1551 or VAS 5051, are listed on the following pages according to the 5 digit DTC code.**

- DTC code appears (in the "Rapid data transfer" mode) only on the print-out.

  Example:

  DIAGNOSTIC TROUBLE CODE (DTC) EXPLANATION - ABS MARK 60

DTC code	P code	DTC type code
5 digit	5 digit	3 digit
18256	P1848	035

- The 5 digit P code which may appear next to the DTC code, is for use with the On Board Diagnosis (OBD) and may be disregarded.
- The 3 digit DTC type code is a data code and may be disregarded, but the DTC type text is of use.
- Before replacing components indicated as being faulty, check all the appropriate connectors, wiring and Ground connections using the wiring diagram.

  See

- On completion of repairs always interrogate the DTC memory with V.A.G 1551 scan tool or the new tester VAS 5051 and erase.
- Carry out road test exceeding 20 km/h (13 mph).
- After the road test check DTC memory again.

DIAGNOSTIC TROUBLE CODE (DTC) - ABS MARK 60 (1 OF 36)

V.A.G 1551 print-out	Possible cause	Repair
No DTC recognized	If "No DTC recognized" appears after carrying out repairs, On Board Diagnostic (OBD) is ended.	
	If, despite "No DTC recognized" appearing in the display, the ABS system does not function properly, then proceed as follows:	
	1. Carry out road test exceeding 20 km/h (13 mph),	
	2. Again check DTC memory, if there is still no DTC stored,	
	3. Continue troubleshooting without OBD and work through the complete Electrical check, see **ELECTRICAL TEST OF MARK 60, VEHICLES FROM M.Y. 10.00**	
Fault number: 0003 / literature	ABS control module (w/EDL) -J104- faulty	• Replace ABS control module (w/EDL) -J104-
		See **HYDRAULIC UNIT, BRAKE BOOSTER/BRAKE MASTER CYLINDER ASSEMBLY OVERVIEW MARK 60** ; **CONTROL MODULE AND HYDRAULIC UNIT, REMOVING AND INSTALLING**

DIAGNOSTIC TROUBLE CODE (DTC) - ABS MARK 60 (2 OF 36)

V.A.G 1551		

printout	Possible cause	Repair
00283		
Left front ABS wheel speed sensor -G47-(1) Electrical malfunction in current circuit	• Open circuit in wiring between left front ABS wheel speed sensor -G47- and ABS control module (w/EDL) -J104-	• Check wiring and connections referring to wiring diagram • Perform electrical check, see from, see **ELECTRICAL TEST OF MARK 60, VEHICLES FROM M.Y. 10.00**
		• Read measured value block, see **MEASURED VALUE BLOCK, READING** Display group number 001
		See **ABS SYSTEM COMPONENTS ON FRONT AND REAR AXLE** ; **ABS SYSTEM COMPONENTS ON FRONT AXLE, REMOVING AND INSTALLING** .
		If the malfunction occurs again:
	• Left front ABS wheel speed sensor -G47- faulty	• Replace left front ABS wheel speed sensor -G47- See **ABS SYSTEM COMPONENTS ON FRONT AND REAR AXLE** ; **ABS SYSTEM COMPONENTS ON FRONT AXLE, REMOVING AND INSTALLING** .
(1) This DTC is recognized when vehicle is stationary.		

DIAGNOSTIC TROUBLE CODE (DTC) - ABS MARK 60 (3 OF 36)

V.A.G 1551 printout	Possible cause	Repair
00283		
Left front ABS wheel speed sensor -G47-(1) Implausible signal	• Open circuit or loose contact in wiring between left front ABS wheel speed sensor -G47- and ABS control module (w/EDL) -J104-	• Check wiring and connections using wiring diagram
		• Perform electrical check, see from, see **ELECTRICAL TEST OF MARK 60, VEHICLES FROM M.Y. 10.00**
	• Electrical interferences from other sources (high frequency radiation e.g. uninsulated ignition cable)	• Read measured value block, see **MEASURED VALUE BLOCK, READING** Display group number 001

(1) This DTC is only recognized above 20 km/h (13 mph) (carry out test drive).

DIAGNOSTIC TROUBLE CODE (DTC) - ABS MARK 60 (4 OF 36)

V.A.G 1551 printout	Possible cause	Repair
00283		
Left front ABS wheel speed sensor -G47- Mechanical fault (1)	• Excessive air gap between left front ABS wheel speed sensor -G47- and rotor (signal not OK.)	• Check installation position of left front ABS wheel speed sensor -G47- and rotor See **ABS SYSTEM COMPONENTS ON FRONT AND REAR AXLE** ; **ABS SYSTEM COMPONENTS ON FRONT AXLE, REMOVING AND INSTALLING** .
		• Read measured value block, see **MEASURED VALUE BLOCK, READING** Display group numbers 001 and 002
		• Perform test drive
	• Short to positive or ground in wiring	• Check wiring and connections using wiring diagram
		• Perform electrical check, see from, see **ELECTRICAL TEST OF MARK 60, VEHICLES FROM M.Y. 10.00**
	• Left front ABS wheel speed sensor -G47- faulty	• Replace left front ABS wheel speed sensor -G47- See **ABS SYSTEM COMPONENTS ON FRONT AND REAR AXLE** ; **ABS SYSTEM COMPONENTS ON FRONT AXLE, REMOVING AND INSTALLING** .

(1) This DTC is only recognized above 20 km/h (13 mph) (carry out test drive).

DIAGNOSTIC TROUBLE CODE (DTC) - ABS MARK 60 (5 OF 36)

V.A.G 1551 printout	Possible cause	Repair
00285		
Right front ABS wheel speed sensor -G45-(1) Electrical malfunction in current circuit	• Open circuit in wiring between right front ABS wheel speed sensor -G45- and ABS control module (w/EDL) -J104-	• Check wiring and connections using to wiring diagram • Perform electrical check, see from, see **ELECTRICAL TEST OF MARK 60, VEHICLES FROM M.Y. 10.00**

		• Read measured value block, see **MEASURED VALUE BLOCK, READING** Display group number 001 See **ABS SYSTEM COMPONENTS ON FRONT AND REAR AXLE** ; **ABS SYSTEM COMPONENTS ON FRONT AXLE, REMOVING AND INSTALLING** .
		If the malfunction occurs again:
	• Right front ABS wheel speed sensor -G45- faulty	• Replace right front ABS wheel speed sensor -G45- See **ABS SYSTEM COMPONENTS ON FRONT AND REAR AXLE** ; **ABS SYSTEM COMPONENTS ON FRONT AXLE, REMOVING AND INSTALLING** .
(1) This malfunction is recognized when vehicle is stationary.		

DIAGNOSTIC TROUBLE CODE (DTC) - ABS MARK 60 (6 OF 36)

V.A.G 1551 printout	Possible cause	Repair
00285		
Right front ABS wheel speed sensor -G45-(1) Implausible signal	• Open circuit; short to ground or loose contact in wiring between right front ABS wheel speed sensor -G45- and ABS control module (w/EDL) -J104-	• Check wiring and connection using wiring diagram
		• Perform electrical check, see from, see **ELECTRICAL TEST OF MARK 60, VEHICLES FROM M.Y. 10.00**
	• Electrical interference from other sources (high frequency radiation e.g. uninsulated ignition cable)	• Read measured value block, see **MEASURED VALUE BLOCK, READING** Display group number 001
(1) This DTC is only recognized above 20 km/h (13 mph) (carry out test drive).		

DIAGNOSTIC TROUBLE CODE (DTC) - ABS MARK 60 (7 OF 36)

V.A.G 1551 printout	Possible cause	Repair

00285		
Right front ABS wheel speed sensor -G45- Mechanical malfunction(1)	• Excessive air gap between right front ABS wheel speed sensor -G45- and rotor (signal not OK.)	• Check installation position of right front ABS wheel speed sensor -G45- and rotor See **ABS SYSTEM COMPONENTS ON FRONT AND REAR AXLE** ; **ABS SYSTEM COMPONENTS ON FRONT AXLE, REMOVING AND INSTALLING** .
		• Read measured value block, see **MEASURED VALUE BLOCK, READING** Display group numbers 001 and 002
		• Perform test drive
	• Short to positive or Ground in wiring	• Check wiring and connections using wiring diagram
		• Perform electrical check, see from, see **ELECTRICAL TEST OF MARK 60, VEHICLES FROM M.Y. 10.00**
	• Right front ABS wheel speed sensor -G45- faulty	• Replace right front ABS wheel speed sensor -G45- See **ABS SYSTEM COMPONENTS ON FRONT AND REAR AXLE** ; **ABS SYSTEM COMPONENTS ON FRONT AXLE, REMOVING AND INSTALLING** .
(1) This DTC is only recognized above 20 km/h (13 mph) (carry out test drive).		

DIAGNOSTIC TROUBLE CODE (DTC) - ABS MARK 60 (8 OF 36)

V.A.G 1551 printout	**Possible cause**	**Repair**
00287		
Right rear ABS wheel speed sensor -G44-(1) Electrical malfunction in current circuit	• Open circuit in wiring between right rear ABS wheel speed sensor -G44- and ABS Control Module (w/EDL) -J104-	• Check wiring and connections using wiring diagram • Perform electrical check, see from, see **ELECTRICAL TEST OF MARK 60, VEHICLES FROM M.Y. 10.00**
		• Read measured value block, see **MEASURED VALUE BLOCK, READING** Display group number 001
		See **ABS SYSTEM COMPONENTS ON FRONT AND REAR AXLE** ; **ABS SYSTEM COMPONENTS ON FRONT AXLE,**

		REMOVING AND INSTALLING .
		If the malfunction occurs again:
	• Right rear ABS wheel speed sensor -G44- faulty	• Replace right rear ABS wheel speed sensor -G44- See **ABS SYSTEM COMPONENTS ON FRONT AND REAR AXLE** ; **ABS SYSTEM COMPONENTS ON FRONT AXLE, REMOVING AND INSTALLING** .
(1) This malfunction is recognized when vehicle is stationary.		

DIAGNOSTIC TROUBLE CODE (DTC) - ABS MARK 60 (9 OF 36)

V.A.G 1551 printout	Possible cause	Repair
00287		
Right rear ABS wheel speed sensor -G44-(1) Implausible signal	• Open circuit; short to ground or loose contact in wiring between right rear ABS wheel speed sensor -G44- and ABS Control Module (w/EDL) -J104-	• Check wiring and connections using wiring diagram
		• Perform electrical check, see from, see **ELECTRICAL TEST OF MARK 60, VEHICLES FROM M.Y. 10.00**
	• Electrical interference from other sources (high frequency radiation e.g. uninsulated ignition cable)	• Read measured value block, see **MEASURED VALUE BLOCK, READING** Display group number 001
(1) This DTC is only recognized above 20 km/h (13 mph) (carry out test drive).		

DIAGNOSTIC TROUBLE CODE (DTC) - ABS MARK 60 (10 OF 36)

V.A.G 1551 printout	Possible cause	Repair
00287		
Right rear ABS wheel speed sensor -G44- (1) Mechanical malfunction	• Excessive air gap between right rear ABS wheel speed sensor -G44- and rotor (signal not OK.)	• Check installation position of right rear ABS wheel speed sensor -G44- and rotor See **ABS SYSTEM COMPONENTS ON FRONT AND REAR AXLE** ; **ABS SYSTEM COMPONENTS ON FRONT AXLE, REMOVING AND INSTALLING** .

		• Read measured value block, see **MEASURED VALUE BLOCK, READING** Display group numbers 001 and 002
		• Perform test drive
	• Short to positive or ground in wiring	• Check wiring and connections using wiring diagram
		• Perform electrical check, see from, see **ELECTRICAL TEST OF MARK 60, VEHICLES FROM M.Y. 10.00**
	• Right rear ABS wheel speed sensor -G44- faulty	• Replace right rear ABS wheel speed sensor -G44- See **ABS SYSTEM COMPONENTS ON FRONT AND REAR AXLE** ; **ABS SYSTEM COMPONENTS ON FRONT AXLE, REMOVING AND INSTALLING** .
(1) This DTC is only recognized above 20 km/h (13 mph) (carry out test drive).		

DIAGNOSTIC TROUBLE CODE (DTC) - ABS MARK 60 (11 OF 36)

V A.G 1551 print-out	Possible cause	Repair
00290		
Left rear ABS wheel speed sensor -G46- (1) Fault in electrical circuit	• Open circuit; short to positive or ground, or loose contact in connections between left rear ABS wheel speed sensor -G46- and ABS Control Module (w/EDL) -J104-	• Check wiring and connections using wiring diagram • Perform electrical check, see from, see **ELECTRICAL TEST OF MARK 60, VEHICLES FROM M.Y. 10.00**
	"BULLET"	• Read measured value block, see **MEASURED VALUE BLOCK, READING** Display group number 001
		See **ABS SYSTEM COMPONENTS ON FRONT AND REAR AXLE** ; **ABS SYSTEM COMPONENTS ON FRONT AXLE, REMOVING AND INSTALLING** .
		If the malfunction occurs again:
	• Left rear ABS wheel speed sensor -G46- faulty	• Replace left rear ABS wheel speed sensor -G46-

		See **ABS SYSTEM COMPONENTS ON FRONT AND REAR AXLE** ; **ABS SYSTEM COMPONENTS ON FRONT AXLE, REMOVING AND INSTALLING** .
(1) This DTC is recognized when vehicle is stationary.		

DIAGNOSTIC TROUBLE CODE (DTC) - ABS MARK 60 (12 OF 36)

V.A.G 1551 printout	Possible cause	Repair
00290		
Left rear ABS wheel speed sensor -G46-(1) Implausible signal	• Open circuit; short to positive or ground, or loose contact in connections between left rear ABS wheel speed sensor -G46- and ABS Control Module (w/EDL) -J104-	• Check wiring and connections using wiring diagram • Perform electrical check, see from, see **ELECTRICAL TEST OF MARK 60, VEHICLES FROM M.Y. 10.00**
	• Electrical interference from other sources (high frequency radiation e.g. uninsulated ignition cable)	• Read measured value block, see **MEASURED VALUE BLOCK, READING** Display group number 001
(1) This DTC is only recognized above 20 km/h (13 mph) (carry out test drive).		

DIAGNOSTIC TROUBLE CODE (DTC) - ABS MARK 60 (13 OF 36)

V.A.G 1551 printout	Possible cause	Repair
00290		
Left rear ABS wheel speed sensor -G46-(1) Mechanical malfunction	• Excessive gap between left rear ABS wheel speed sensor -G46- and rotor (signal not OK)	• Check installation of left rear ABS wheel speed sensor -G46- and rotor See **ABS SYSTEM COMPONENTS ON FRONT AND REAR AXLE** ; **ABS SYSTEM COMPONENTS ON FRONT AXLE, REMOVING AND INSTALLING** .
		• Read measured value block, see **MEASURED VALUE BLOCK, READING** Display group numbers 001 and 002
		• Perform test drive
	• Short to positive or Ground in wiring	• Check wiring and connections using wiring diagram
		• Perform electrical check, see from, see

		ELECTRICAL TEST OF MARK 60, VEHICLES FROM M.Y. 10.00
	• Left rear ABS wheel speed sensor -G46- faulty	• Replace left rear ABS wheel speed sensor -G46- See **ABS SYSTEM COMPONENTS ON FRONT AND REAR AXLE** ; **ABS SYSTEM COMPONENTS ON FRONT AXLE, REMOVING AND INSTALLING** .
(1) This DTC is only recognized above 20 km/h (13 mph) (carry out test drive).		

DIAGNOSTIC TROUBLE CODE (DTC) - ABS MARK 60 (14 OF 36)

V.A.G 1551 print-out	Possible cause	Repair
00493		
ESP-Sensor Unit, vehicles from my 12.01 No Signal/Communication or ESP-Sensor Unit faulty	• Open circuit, short to positive or ground in data bus wiring • ESP Sensor Unit -G419- faulty	• Check wiring and connectors of data bus wiring using current flow diagram • Perform electrical check, see from, see **ELECTRICAL TEST OF MARK 60, VEHICLES FROM M.Y. 10.00** • Replace ESP-Sensor Unit -G419- See **ESP SYSTEM COMPONENTS, REMOVING AND INSTALLING** . • Perform a zero compensation: • Initiate basic setting, see **INITIATING BASIC SETTING** Display group number 063

DIAGNOSTIC TROUBLE CODE (DTC) - ABS MARK 60 (15 OF 36)

V.A.G 1551 print-out	Possible cause	Rectifying fault
00495		
ESP-Sensor Unit, vehicles from m.y. 12.01 Voltage supply	• Open circuit, short to positive or ground in the wiring	• Check wiring and connections using current flow diagram See
		• Perform electrical check, see from, see **ELECTRICAL TEST OF MARK 60, VEHICLES FROM M.Y. 10.00**

DIAGNOSTIC TROUBLE CODE (DTC) - ABS MARK 60 (16 OF 36)

V.A.G 1551 printout	Possible cause	Repair
00526		
Brake light switch -F-(1) Implausible signal	• Open circuit, short to positive or ground in the wiring	• Read measured value block, see **MEASURED VALUE BLOCK, READING** Display group number 002 • Check wiring and connections using wiring diagram
		• Perform electrical check, see from, see **ELECTRICAL TEST OF MARK 60, VEHICLES FROM M.Y. 10.00**
	• Brake light switch improperly adjusted • Brake light switch faulty	• Adjust brake light switch, see **ADJUSTING BRAKE LIGHT SWITCH**
(1) With ABS/EDL/ASR/ESP only.		

DIAGNOSTIC TROUBLE CODE (DTC) - ABS MARK 60 (17 OF 36)

V.A.G 1551 printout	Possible cause	Repair
00538		
Reference voltage Malfunction in electrical circuit	• Short to positive or ground in wiring for voltage supply • Voltage supply is less than 5 Volt • Sender for rotation rate -G202- • Sensor for transverse acceleration -G200- • Sender 1 for brake booster -G201-	• Check wiring and connections referring to wiring diagram • Perform electrical check, see from, see **ELECTRICAL TEST OF MARK 60, VEHICLES FROM M.Y. 10.00**
00668		
Vehicle voltage terminal 30 Implausible signal	• Open circuit, short to positive or ground in the wiring	• Check wiring and connections using wiring diagram
		• Perform electrical check, see from, see **ELECTRICAL TEST OF MARK 60, VEHICLES FROM M.Y. 10.00**
	• Alternator voltage > 17 Volt	

DIAGNOSTIC TROUBLE CODE (DTC) - ABS MARK 60 (18 OF 36)

V.A.G 1551 print-out	Possible cause	Repair
00778		
Steering angle sensor -G85- No signal/communication (1)	• Open circuit or loose contact in data bus wiring between steering angle sensor -G85- and ABS control module (w/EDL) -J104- • Terminal 15 and 30 on steering angle sensor -G85-, Ground not present	• Check wiring and connections using wiring diagram
		• Perform electrical check, see from, see **ELECTRICAL TEST OF MARK 60, VEHICLES FROM M.Y. 10.00**
	• Steering angle sensor -G85- faulty	• Replace steering angle sensor -G85- See **ESP SYSTEM COMPONENTS, REMOVING AND INSTALLING** ; **STEERING ANGLE SENSOR -G85-, REMOVING AND INSTALLING** .
		• Perform a zero compensation. Initiating basic settings, see **INITIATING BASIC SETTING** Display group number 060
(1) With ABS/EDL/ASR/ESP only.		

DIAGNOSTIC TROUBLE CODE (DTC) - ABS MARK 60 (19 OF 36)

V.A.G 1551 print-out	Possible cause	Repair
00778		
Steering angle sensor -G85-(1) Mechanical malfunction	• Steering wheel has been removed and then no zero compensation has been performed.	• Perform a zero compensation. Initiating basic settings, see **INITIATING BASIC SETTING** Display group number 060
	• Check specification from steering angle sensor -G85-	• Read measured value block, see **MEASURED VALUE BLOCK, READING** Display group number 004
	• Steering geometry of suspension is not OK	• Check vehicle alignment. See **SPECIFICATIONS & PROCEDURES**

		for vehicle alignment.
	• Installation of steering angle sensor -G85- is not OK	• Check installation of steering angle sensor -G85-
	• Steering angle sensor -G85- faulty	• Replace steering angle sender -G85- See **ESP SYSTEM COMPONENTS, REMOVING AND INSTALLING** ; **STEERING ANGLE SENSOR -G85-, REMOVING AND INSTALLING** .
(1) With ABS/EDL/ASR/ESP only.		

DIAGNOSTIC TROUBLE CODE (DTC) - ABS MARK 60 (20 OF 36)

V.A.G 1551 print-out	Possible cause	Repair
00778		
Steering angle sensor -G85- Implausible signal (1)	• Installation of steering angle sensor -G85- is not OK.	• Check installation of steering angle sensor -G85-
		See **ESP SYSTEM COMPONENTS, REMOVING AND INSTALLING** .
	• Steering geometry of suspension is not OK.	• Check vehicle alignment See **SPECIFICATIONS & PROCEDURES** for vehicle alignment.
	• Unacceptable vibrations in steering due to wear.	• Perform a zero compensation. Initiating basic settings, see **INITIATING BASIC SETTING** Display group number 060
00778		
Steering angle sensor -G85-(1) No or incorrect basic settings / adaptation	• Steering angle sensor -G85- sends no or incorrect setting values	• Perform a zero compensation. Initiating basic settings, see **INITIATING BASIC SETTING** Display group number 060
(1) With ABS/EDL/ASR/ESP only.		

DIAGNOSTIC TROUBLE CODE (DTC) - ABS MARK 60 (21 OF 36)

V.A.G 1551 print-out	Possible cause	Repair

00778		
Steering angle sensor -G85- faulty(1)	• Steering angle sensor -G85- faulty	• Replace steering angle sensor -G85- See **ESP SYSTEM COMPONENTS, REMOVING AND INSTALLING** .
		• Perform a zero compensation. Initiating basic settings, see **INITIATING BASIC SETTING** Display group number 060
01044		
Control module incorrectly coded	• ABS control module (w/EDL) -J104- incorrectly coded	• Check coding for ABS control module (w/EDD -.1104-, see **MEASURED VALUE BLOCK, READING**
	• Open circuit or short circuit in coding bridge in multi-pin connector to ABS control module (w/EDL) -J104-	• Check wiring and connections using wiring diagram See
(1) With ABS/EDL/ASR/ESP only.		

DIAGNOSTIC TROUBLE CODE (DTC) - ABS MARK 60 (22 OF 36)

V.A.G 1551 print-out	Possible cause	Repair
01130		
ABS operation Implausible signal(1)	• Electrical interference from other sources (high frequency radiation e.g. non-insulated ignition cable)	• Erase DTC memory • Perform test drive at more than 20 km/h (13 mph) • Check DTC memory again
	• Open circuit, short to positive or Ground in the wiring	• Check wiring and connections using wiring diagram
		• Perform electrical check, see from, see **ELECTRICAL TEST OF MARK 60, VEHICLES FROM M.Y. 10.00**
	• ABS control module (w/EDL) -J104- faulty	• Replace ABS control module (w/EDL) -J104- See **HYDRAULIC UNIT, BRAKE BOOSTER/BRAKE MASTER CYLINDER - ASSEMBLY OVERVIEW MARK 60** ;

		CONTROL MODULE AND HYDRAULIC UNIT, REMOVING AND INSTALLING .
(1) This DTC is only recognized above 20 km/h (13 mph) (carry out test drive).		

DIAGNOSTIC TROUBLE CODE (DTC) - ABS MARK 60 (23 OF 36)

V A.G 1551 print-out	Possible cause	Repair
01164		
ESP operation Implausible signal(1)	• Electrical interferences from external interference sources (high frequency radiation, e.g. non-insulated ignition cable)	• Erase DTC memory • Carry out a test drive exceeding 20 km/h (13 mph) • Check DTC memory again
	• Open circuit, short to positive or ground in the wiring	• Check wiring and connections using wiring diagram
	• Steering angle sensor -G85- sends incorrect setting values	• Perform electrical check, see from, see **ELECTRICAL TEST OF MARK 60, VEHICLES FROM M.Y. 10.00** • Perform a zero compensation:
	• ABS control module (w/EDL) -J104- faulty	• Replace ABS control module (w/EDL) -J104-. See **HYDRAULIC UNIT, BRAKE BOOSTER/BRAKE MASTER CYLINDER - ASSEMBLY OVERVIEW MARK 60** ; **CONTROL MODULE AND HYDRAULIC UNIT, REMOVING AND INSTALLING** .
(1) Type of DTC, this DTC is only recognized above 20 km/h (13 mph) (carry out test drive).		

DIAGNOSTIC TROUBLE CODE (DTC) - ABS MARK 60 (24 OF 36)

V.A.G 1551 print-out	Possible cause	Repair
01276		
ABS hydraulic pump -V64- Implausible signal()	• Transfer resistance in Ground or positive wire	• Check wiring and connections using wiring diagram
		• Perform electrical check, see from, see **ELECTRICAL TEST OF MARK 60, VEHICLES FROM M.Y. 10.00**
	• ABS hydraulic pump -V64-	• Replace ABS hydraulic unit -N55-

	faulty	See **HYDRAULIC UNIT, BRAKE BOOSTER/BRAKE MASTER CYLINDER - ASSEMBLY OVERVIEW MARK 60** ; **CONTROL MODULE AND HYDRAULIC UNIT, REMOVING AND INSTALLING** .
01276		
ABS hydraulic pump -V64- Faulty(1)	• Short circuit in electronics	• Replace ABS hydraulic unit -N55- with ABS control module (w/EDL)-J104- See **HYDRAULIC UNIT, BRAKE BOOSTER/BRAKE MASTER CYLINDER - ASSEMBLY OVERVIEW MARK 60** ; **CONTROL MODULE AND HYDRAULIC UNIT, REMOVING AND INSTALLING** .
(1) This DTC is only recognized above 20 km/h (13 mph) (carry out test drive).		

DIAGNOSTIC TROUBLE CODE (DTC) - ABS MARK 60 (25 OF 36)

V.A.G 1551 printout	Possible cause	Repair
01276		
ABS hydraulic pump -V64- Electrical malfunction in current circuit(1)	• Battery positive fuse faulty	• Check fuses
	• Open circuit, short to positive or Ground in the wiring	• Check wiring and connections using wiring diagram
		• Perform electrical check, see from, see **ELECTRICAL TEST OF MARK 60, VEHICLES FROM M.Y. 10.00**
	• ABS hydraulic pump -V64- faulty	• Replace ABS hydraulic unit -N55- See **HYDRAULIC UNIT, BRAKE BOOSTER/BRAKE MASTER CYLINDER - ASSEMBLY OVERVIEW MARK 60** ; **CONTROL MODULE AND HYDRAULIC UNIT, REMOVING AND INSTALLING** .
(1) This DTC is only recognized above 20 km/h (13 mph) (carry out test drive).		

DIAGNOSTIC TROUBLE CODE (DTC) - ABS MARK 60 (26 OF 36)

V.A.G 1551 print-out	Possible cause	Repair
01312		
Drive train data bus faulty(1)		• Read measured value block, see **MEASURED VALUE BLOCK, READING** , Display group number 125
	• Open circuit, short to positive or Ground in data bus wiring	• Check wiring and connections of data bus wiring using wiring diagram
		• Perform electrical check, see from, see **ELECTRICAL TEST OF MARK 60, VEHICLES FROM M.Y. 10.00**
(1) This DTC only occurs together with DTC: "Steering angler sensor -G85-, No communication".		

DIAGNOSTIC TROUBLE CODE (DTC) - ABS MARK 60 (27 OF 36)

V.A.G 1551 print-out	Possible cause	Repair
01314		
Engine control module No signal/communication		• Read measured value block, see **MEASURED VALUE BLOCK, READING** Display group number 125
	• Open circuit, short to positive or Ground in data bus wiring	• Check wiring and connections of data bus wiring using wiring diagram
or:		
		• Perform electrical check, see from, see **ELECTRICAL TEST OF MARK 60, VEHICLES FROM M.Y. 10.00**
Check DTC memory	• DTC entry in engine control module	• Check DTC memory of engine control module.

DIAGNOSTIC TROUBLE CODE (DTC) - ABS MARK 60 (28 OF 36)

V.A.G 1551 print-out	Possible cause	Repair
01315		
Transmission control module (1) No signal/communication		• Read measured value block, see **MEASURED VALUE BLOCK, READING** Display group number 125
	• Open circuit, short to positive or Ground in data bus wiring	• Check wiring and connections of data bus wiring using wiring diagram

		• Perform electrical check, see from, see **ELECTRICAL TEST OF MARK 60, VEHICLES FROM M.Y. 10.00**
01317		
Control module with indicator unit in instrument panel insert -J285-	• Control module with indicator unit in instrument panel insert -J285- incorrectly coded	• Check control module with indicator unit in instrument panel insert -J285- coding See **INSTRUMENT CLUSTER FROM 06.99 & UP , ON BOARD DIAGNOSTIC (OBD)** .
(1) Vehicles with an automatic Transmission only		

DIAGNOSTIC TROUBLE CODE (DTC) - ABS MARK 60 (29 OF 36)

V.A.G 1551 print-out	Possible cause	Repair
01423		
Sensor for transverse acceleration -G200-(1) Electrical malfunction in current circuit	• Check connections • Voltage supply less than 5 Volt	
	• Open circuit, short to positive or Ground in the wiring	• Check wiring and connections referring to wiring diagram
		• Perform electrical check, see from, see **ELECTRICAL TEST OF MARK 60, VEHICLES FROM M.Y. 10.00**
	• Sensor for transverse acceleration -G200- faulty	• Replace sensor for transverse acceleration -G200- See **ESP SYSTEM COMPONENTS, REMOVING AND INSTALLING** .
		• Perform a zero compensation. Initiating basic settings, see **INITIATING BASIC SETTING** Display group number 063
(1) With ABS/EDL/ASR/ESP only.		

DIAGNOSTIC TROUBLE CODE (DTC) - ABS MARK 60 (30 OF 36)

V.A.G 1551 print-out	Possible cause	Repair

01423		
Sensor for transverse acceleration - G200- Implausible signal (1)		• Read measured value block, see **MEASURED VALUE BLOCK, READING** Display group number 004
	• The installation position of sensor for transverse acceleration -G200- is not OK.	• Check installation position of sensor for transverse acceleration -G200-.
	• Open circuit, short to positive or Ground in the wiring	• Check wiring and connections using wiring diagram • Perform electrical check, see from, see **ELECTRICAL TEST OF MARK 60, VEHICLES FROM M.Y. 10.00**
	• Sensor for transverse acceleration -G200- faulty	• Replace sensor for transverse acceleration -G200-. See **ESP SYSTEM COMPONENTS, REMOVING AND INSTALLING** .
	• Basic settings was not performed correctly in the past	• Perform a zero compensation. Initiating basic settings, see **INITIATING BASIC SETTING** Display group number 063
(1) With ABS/EDL/ASR/ESP only.		

DIAGNOSTIC TROUBLE CODE (DTC) - ABS MARK 60 (31 OF 36)

V.A.G 1551 print-out	Possible cause	Repair
01423		
Sensor for transverse acceleration -G200-() No or incorrect basic settings / adaptation	• A zero compensation has never been performed.	• Perform a zero compensation. Initiating basic settings, see **INITIATING BASIC SETTING** Display group number 063
01435		
Sender 1 for brake booster - G201- No or incorrect basic settings / adaptation (1)	• A zero compensation has never been performed.	• Perform a zero compensation. Initiating basic settings, see **INITIATING BASIC SETTING** Display group number 066

(1) With ABS/EDL/ASR/ESP only.

DIAGNOSTIC TROUBLE CODE (DTC) - ABS MARK 60 (32 OF 36)

V.A.G 1551 print-out	Possible cause	Repair
01435		
Sender 1 for brake booster -G201- Implausible signal (1)		• Read measured value block, see **MEASURED VALUE BLOCK, READING** Display group number 005
	• Open circuit, short to positive or Ground in the wiring	• Check wiring and connections using wiring diagram • Perform electrical check, see from, see **ELECTRICAL TEST OF MARK 60, VEHICLES FROM M.Y. 10.00**
	• Brake light switch improperly adjusted • Brake light switch faulty	• Adjust brake light switch, see **ADJUSTING BRAKE LIGHT SWITCH**
	• Sender 1 for brake booster -G201- faulty	• Replace sender 1 for brake booster -G201 See **HYDRAULIC UNIT, BRAKE BOOSTER/BRAKE MASTER CYLINDER - ASSEMBLY OVERVIEW MARK 60** . See .
		• Perform a zero compensation. Initiating basic settings, see **INITIATING BASIC SETTING** Display group number 066
(1) With ABS/EDL/ASR/ESP only.		

DIAGNOSTIC TROUBLE CODE (DTC) - ABS MARK 60 (33 OF 36)

V.A.G 1551 print-out	Possible cause	Repair
01435		
Sender 1 for brake booster -G201- Electrical malfunction in current circuit(1)	• Connections • Voltage supply is less than 5 Volt	
	• Open circuit,	• Check wiring and connections using wiring diagram

	short to positive or ground in the wiring	
		• Perform electrical check, see from, see **ELECTRICAL TEST OF MARK 60, VEHICLES FROM M.Y. 10.00**
	• Sender 1 for brake booster 1 -G201- faulty	• Replace sender 1 for brake booster -G201- See ASSEMBLY OVERVIEW: BRAKE BOOSTER/BRAKE MASTER CYLINDER FOR VEHICLES WITH ABS/EDL/ASR/ESP; REMOVING AND INSTALLING SENDER 1 FOR BRAKE BOOSTER -G201- AND SENSOR -2- FOR BRAKE PRESSURE -G214- FROM BRAKE MASTER CYLINDER
		• Perform a zero compensation. Initiating basic settings, see **INITIATING BASIC SETTING** Display group number 066
(1) With ABS/EDL/ASR/ESP only.		

DIAGNOSTIC TROUBLE CODE (DTC) - ABS MARK 60 (34 OF 36)

V.A.G 1551 print-out	Possible cause	Repair
01486/ literature()		
	• The ESP driving test is activated	• Perform the complete ESP driving test; the DTC will be erased automatically
		• Initiate basic setting, see **INITIATING BASIC SETTING** Display group number 093
01486/ literature(1)		
	• The ESP driving test time has been exceeded	• Perform the complete ESP driving test within the allowed time
(1) With ABS/EDL/ASR/ESP only.		

DIAGNOSTIC TROUBLE CODE (DTC) - ABS MARK 60 (35 OF 36)

V.A.G 1551 printout	Possible cause	Repair
01542		
Sender for rotation rate -G202-		• Read measured value block, see **MEASURED VALUE BLOCK,**

Implausible signal (1)		**READING** Display group number 004
	• Installation of sender for rotation rate -G202- is not OK.	• Check installation of sender for rotation rate -G202-
	• Open circuit, short to positive or ground in the wiring	• Check wiring and connections using wiring diagram • Perform electrical check, see from, see **ELECTRICAL TEST OF MARK 60, VEHICLES FROM M.Y. 10.00**
	• Sender for rotation rate -G202- faulty	• Replace sender for rotation rate -G202-: See **ESP SYSTEM COMPONENTS, REMOVING AND INSTALLING** .
(1) With ABS/EDL/ASR/ESP only.		

DIAGNOSTIC TROUBLE CODE (DTC) - ABS MARK 60 (36 OF 36)

V.A.G 1551 print-out	Possible cause	Repair
01542		
Sender for rotation rate -G202-(1) Electrical malfunction in current circuit		• Connections • Voltage supply is less than 5 Volt
	• Open circuit, short to positive or Ground in the wiring	• Check wiring and connections using wiring diagram
		• Perform electrical check, see from, see **ELECTRICAL TEST OF MARK 60, VEHICLES FROM M.Y. 10.00**
	• Sender for rotation rate -G202- faulty	• Replace sender for rotation rate -G202-. See **ESP SYSTEM COMPONENTS, REMOVING AND INSTALLING** .
(1) With ABS/EDL/ASR/ESP only.		

DIAGNOSTIC TROUBLE CODE (DTC) ERASING MEMORY, ENDING OUTPUT

NOTE: All functions that have so far been carried out with V.A.G 1551 can now also be carried out with the tester VAS 5051.

Requirements:

- DTC memory checked, see **DIAGNOSTIC TROUBLE CODE (DTC) MEMORY, CHECKING** .

1. **Erasing DTC memory**
   - Press --> key.

   Indicated on display:

   - Press keys -0- and -5-; 05 enters the "Erase DTC memory" function.

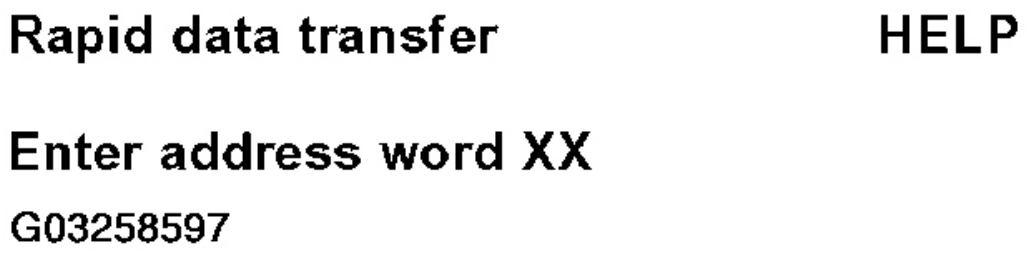


Fig. 174: V.A.G 1551 Scan Tool Display - Erasing DTC Memory (1 Of 7)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display:

- Confirm entry with Q key

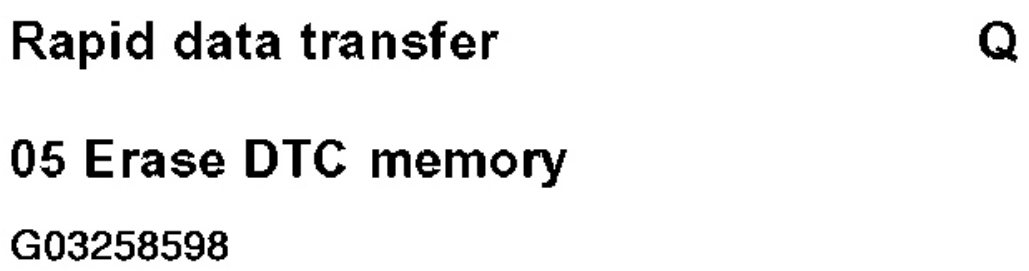


Fig. 175: V.A.G 1551 Scan Tool Display - Erasing DTC Memory (2 Of 7)

Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display:

- Press --> key.

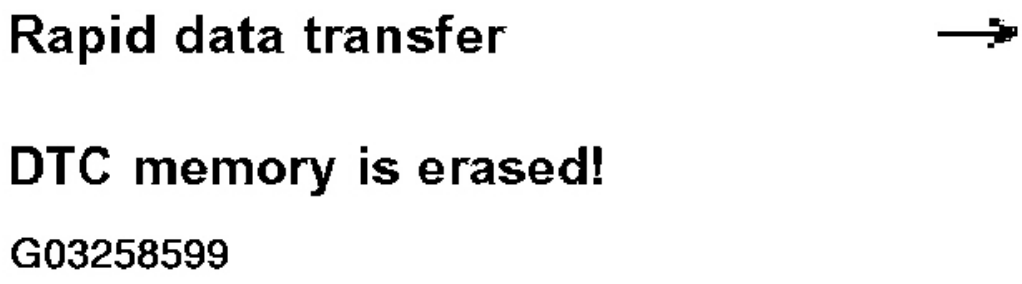


Fig. 176: V.A.G 1551 Scan Tool Display - Erasing DTC Memory (3 Of 7)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display:

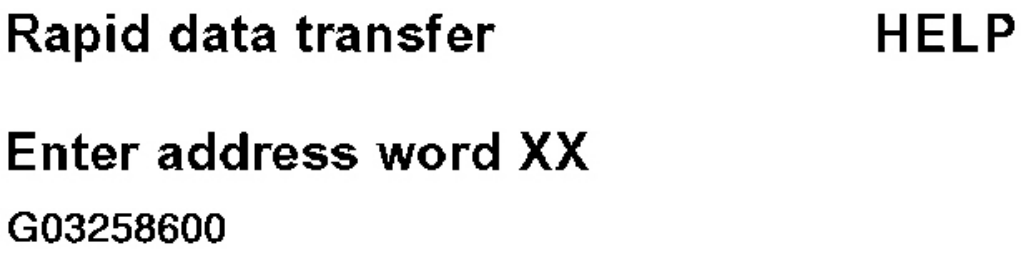


Fig. 177: V.A.G 1551 Scan Tool Display - Erasing DTC Memory (4 Of 7)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display:

NOTE: Adhere exactly to test sequence: First check DTC memory, then erase

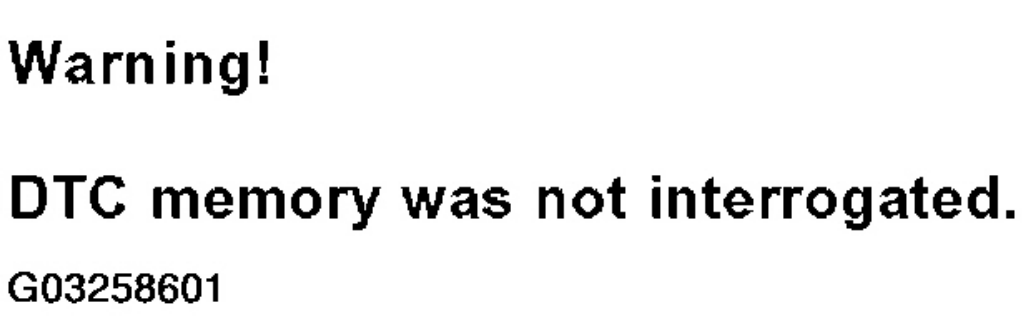


Fig. 178: V.A.G 1551 Scan Tool Display - Erasing DTC Memory (5 Of 7)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

2. **Ending output**
    - Press keys -0- and -6-, this ends the output.

Indicated on display:

- Confirm input with Q key.

Fig. 179: V.A.G 1551 Scan Tool Display - Erasing DTC Memory (6 Of 7)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display:

- Switch off ignition.
- Disconnect connection to V.A.G 1551 scan tool.
- Switch on ignition.

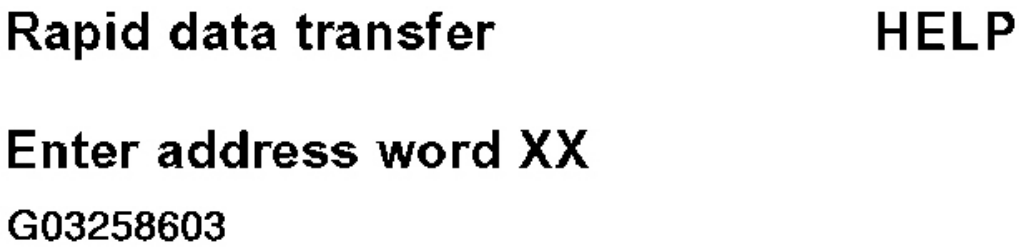


Fig. 180: V.A.G 1551 Scan Tool Display - Erasing DTC Memory (7 Of 7)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

ABS warning light -K47- must go out after approx. 2 seconds.

ABS CONTROL MODULE, CODING

- All functions which could previously be performed with V.A.G 1551 can also be carried out with the tester VAS 5051.
- When ABS control module (w/EDL) -J104- is coded with 00000, ABS warning light -K47- and warning light for brake system -K118- flash. An entry is not made in the DTC memory.
- The ABS control module (w/EDL) -J104- must be recoded if the vehicle relevant coding is not displayed or the control module has been replaced.

Coding is only possible after the workshop code (WSC) has been introduced into V.A.G 1551.

Test sequence

- Connect V.A.G 1551 scan tool and select (address word 03) brake electronics control module with ignition switched on; see **LIST OF SELECTABLE FUNCTIONS** .
- Establish engine code.

Indicated on display:

- Input 07 for the function "Code control module" and confirm with Q key.

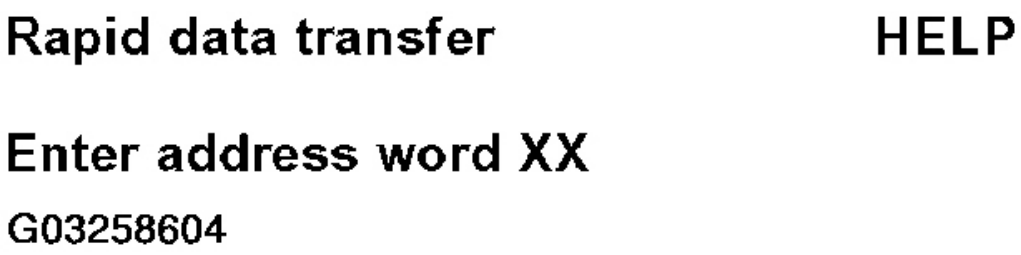


Fig. 181: V.A.G 1551 Scan Tool Display - Coding ABS Control Module (1 Of 4)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display:

- Confirm input with Q key.

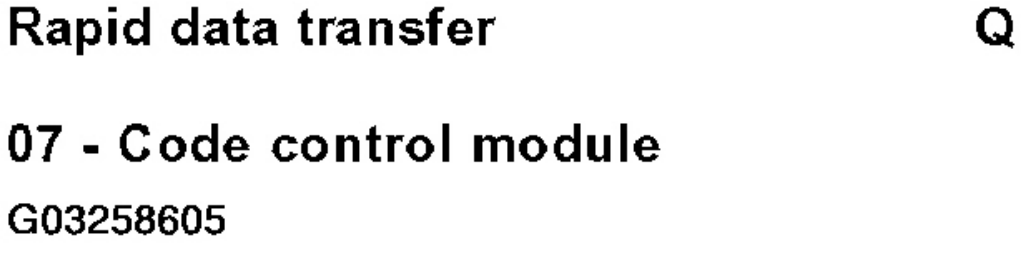


Fig. 182: V.A.G 1551 Scan Tool Display - Coding ABS Control Module (2 Of 4)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display:

- Enter the relevant code number for this vehicle and confirm with Q key.

  Coding variations, see **CODING TABLE FOR ABS** .

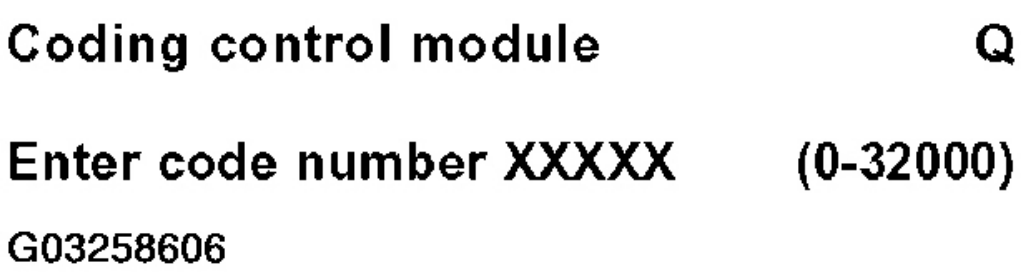


Fig. 183: V.A.G 1551 Scan Tool Display - Coding ABS Control Module (3 Of 4)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Control module identification is displayed on display of V.A.G 1551 scan tool, e.g.:

Fig. 184: V.A.G 1551 Scan Tool Display - Coding ABS Control Module (4 Of 4)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

VEHICLE DATA LABEL

Explanation of the PR. numbers on vehicle data label

Various wheels are installed depending on engine and equipment level. These are identified by the PR. numbers.

The wheel installed in the vehicle is documented on the vehicle data label with the relevant PR number.

See **SPECIFICATIONS & PROCEDURES** .

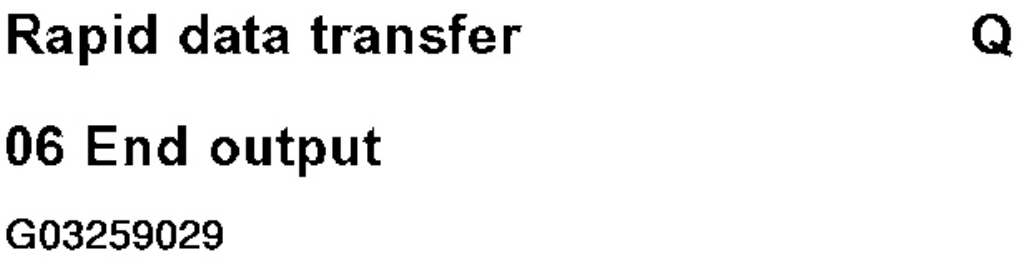


Fig. 185: Identifying Location Of Optional Equipment Number (PR No.) On Vehicle Data Plate
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Depending on equipment level, the PR number is printed in different locations on the vehicle data label.

In this example the vehicle is equipped with the standard wheel 1ZM -arrow-.

The PR numbers are critical for the assignment of coding.

PR NUMBER (1 Of 2)

PR number	Brakes
1LS	FS III Brakes
1LQ	FS III Brakes
1ZM	FS III Brakes
1ZF	FS III Brakes

PR NUMBER (1 OF 3)

PR number	Brakes
1LE	FN 3 Brakes
1LJ	FN 3 Brakes
1ZE	FN 3 Brakes

Coding table for ABS

- *Note: the control module must be coded with the same code number as the previous control module installed in the vehicle*

With control unit identification number 1C0 907 379 C/J/L for vehicles from m.y. 10.00

CODING

Engine	Engine code	Vehicle type	Code number

1.8 ltr.	APH; AWV; AWP	Front wheel drive	04097
1.9 ltr. TDI	ALH; BEW	Front wheel drive	04097
2.0 ltr.	AEG;AVH;AZG;BBW, BEV	Front wheel drive	04097

Table for ABS/EDL, coding

- Note: the control module must be coded with the same code number as the previous control module installed in the vehicle

With control unit identification number 1C0 907 379 E for vehicles up to m.y. 09.2000

CODING

Engine	Engine code	Vehicle type	Code number
1.8 ltr.	APH; AWV	Front wheel drive	13504
1.9 ltr. TDI	ALH	Front wheel drive	13504
2.0 ltr.	AEG	Front wheel drive	13504

Table for ABS/EDL/ASR, coding

- Note: the control module must be coded with the same code number as the previous control module installed in the vehicle

With control unit identification number 1C0 907 379 D/K for vehicles from m.y. 10.00

ABS/EDL/ASR CODING

Engine	Engine code	Vehicle type	Code number
1.8 ltr.	APH; AWV; AWP	Front wheel drive	18945

Table for ABS/EDL/ASR/ESP, coding

- *Note: the control module must be coded with the same code number as the previous control module installed in the vehicle*

With control unit identification number 1C0 907 379 for vehicles up to m.y. 09.00

ABS/EDL/ASR/ESP CODING

Engine	Engine code	Vehicle type	Code number
1.8 ltr.	APH; AWV	Front wheel drive	18945
1.9 ltr. TDI	ALH	Front wheel drive	18945
2.0 ltr.	AEG; AVH; AZG	Front wheel drive	18433

Table for ABS/EDL/ASR/ESP, coding

- Note: the control module must be coded with the same code number as the previous control module installed in the vehicle

with control unit identification number 1C0 907 379 E/G/M for vehicles from m.y. 10.00

ABS/EDL/ASR/ESP CODING

Engine	Engine code	Brake versions(1)	Heavy-duty package(2)	Coding
1.8ltr.	APH; AWV; AWP	FN3	sin	19970
		con	20098	
2.0 ltr.	AEG; AVH; AZG; BBW, BEV	FS III	without	22530
		with	22658	
1.9 ltr. TDI	ALH; BEW	FS III	without	19458
		with	19586	

(1) Overview of types of brakes (PR No.), see **VEHICLE DATA LABEL** .

(2) Overview of types of vehicle.

See

MEASURED VALUE BLOCK, READING

NOTE: All functions which could previously be performed with V.A.G 1551 can now also be carried out with the tester VAS 5051.

The control module can transfer a considerable amount of test data. This test data delivers information on the operational condition of the system and/or sensor connected to it. In many cases the transferred test data supports troubleshooting and repair. The test data has been summarized into single display groups because all the information cannot be evaluated at the same time. The information can be selected via display group numbers.

Safety measures

WARNING:

- **If the use of test and information devices during a test drive is necessary, observe the following:**
- **You must always secure testing and measuring equipment on the rear seat.**
- **When vehicle is being driven, a second technician must operate this equipment.**

- Connect V.A.G 1551 scan tool and select (address word 03) brake electronics control module with ignition switched on; see **LIST OF SELECTABLE FUNCTIONS** .

Indicated on display:

- Press keys 0 and 8. (The function "Read measured value block" is initiated with 08.)

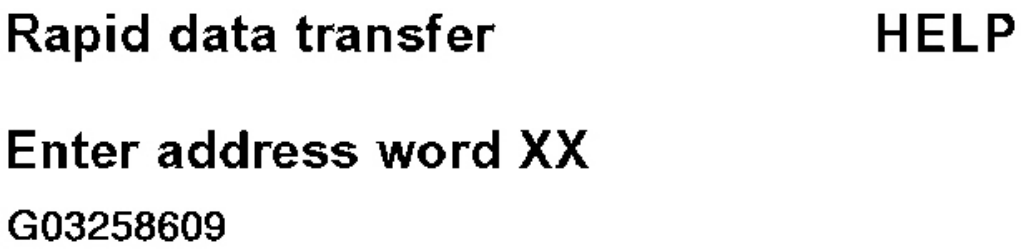


Fig. 186: V.A.G 1551 Scan Tool Display - Reading Measured Value Block (1 Of 3)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display:

- Confirm entry with key Q.

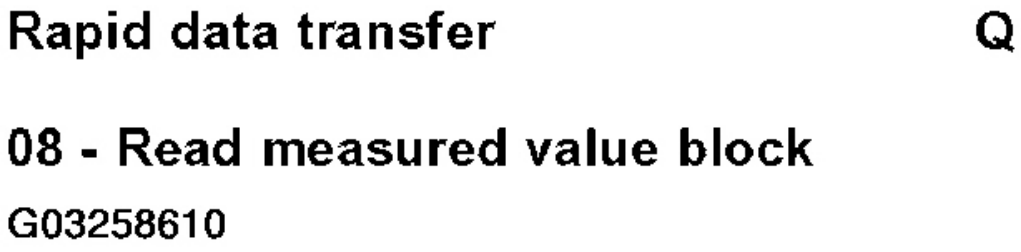


Fig. 187: V.A.G 1551 Scan Tool Display - Reading Measured Value Block (2 Of 3)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display:

- Enter display group number, see List of selectable display group numbers, see **OVERVIEW OF SELECTABLE DISPLAY GROUP NUMBERS** .

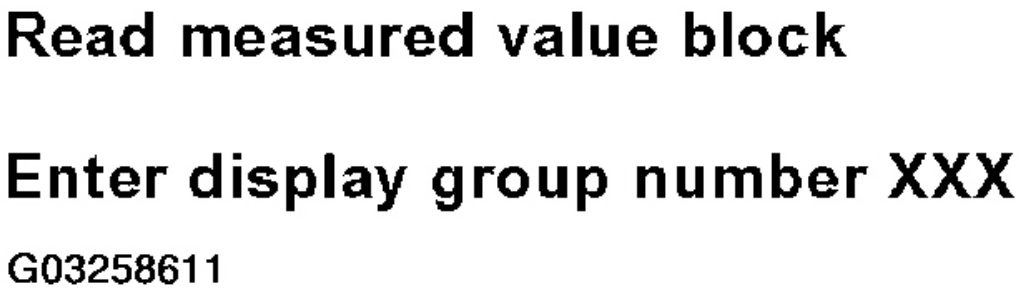


Fig. 188: V.A.G 1551 Scan Tool Display - Reading Measured Value Block (3 Of 3)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Overview of selectable display group numbers

SELECTABLE DISPLAY GROUP NUMBERS (1 Of 2)

Display group number	Display zone	Designation
001	1	Wheel speed at left front wheel sensor (km/h)
	2	Wheel speed at right front wheel sensor (km/h)
	3	Wheel speed at left rear speed sensor (km/h)
	4	Wheel speed at right rear speed sensor (km/h)
002	1	Wheel speed at left front speed sensor (km/h)
	2	Wheel speed at right front wheel sensor (km/h)
	3	Wheel speed at left rear speed sensor (km/h)
	4	Wheel speed at right rear speed sensor (km/h)
003	1	Brake light switch
	2	Brake system warning light
	3	ABS warning light
	4	ASR/ESP warning light

SELECTABLE DISPLAY GROUP NUMBERS (2 Of 2)

Display group number	Display zone	Designation
004	1	Steering angle sensor
	2	Lateral acceleration sender
	3	Sender for rotation rate
	4	Vacant
005	1	Brake pressure sensor
	2	Vacant
	3	Vacant

	4	Vacant
125	1	Data bus for engine
	2	Data bus for steering angle(1)
	3	Vacant
	4	Data bus for Transmission(2)

(1) With ABS/EDL/ASR/ESP only.

(2) Vehicles with an automatic Transmission only

Test sequence and test tables with measured values

Checking speed sensor application

Display group number 001

- Press keys 0, 0 and 1.
- Confirm entry with key Q.
- There are always 4 display zones -arrows- in the measured value block. Decoding the individual values in display zones 1 to 4 can be read-off from the following tables.

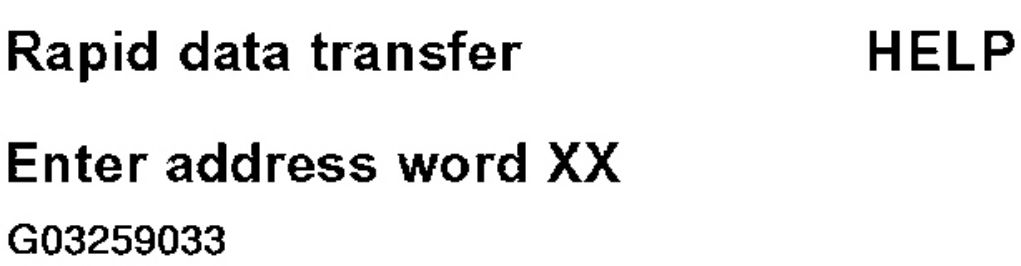


Fig. 189: V.A.G 1551 Scan Tool Display - Checking Speed Sensor Application (1 Of 2)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display: (vehicle stationary)

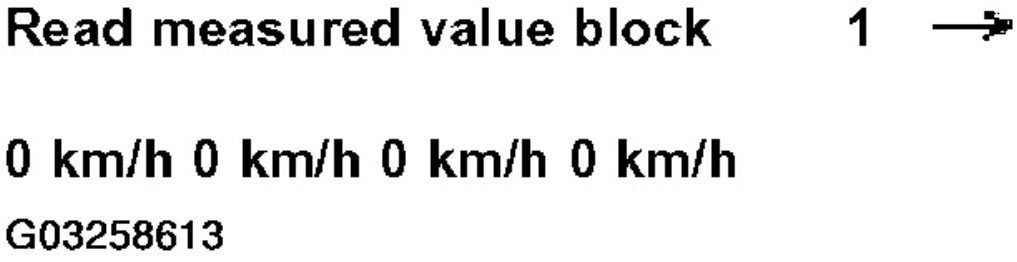


Fig. 190: V.A.G 1551 Scan Tool Display - Checking Speed Sensor Application (2 Of 2)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Press C key for the next display group number entry.

If the --> key is pressed, keys 0 and 8 for work sequence "Read measured value block" must be pressed again afterwards to regain entry.

NOTE: For display group number 001 remember:
The actual wheel speeds are displayed. They serve to check the speed sensor allocation to the wheel. (The vehicle must be raised and the wheel must be rotated by hand by a 2nd mechanic).

DISPLAY GROUP NUMBER: 001

<table>
<tr><td colspan="3">Read measured value block</td><td>1 --></td><td>Display group number: 001</td></tr>
<tr><td>0km/h</td><td>4km/h</td><td>0km/h</td><td>0 km/h</td><td><-Indicated on display: (Example)</td></tr>
<tr><td></td><td></td><td></td><td></td><td>Wheel speed at right rear speed sensor
• (0...255 km/h)</td></tr>
<tr><td></td><td></td><td></td><td colspan="2">Wheel speed at left rear speed sensor
• (0...255 km/h)</td></tr>
<tr><td></td><td></td><td colspan="3">Wheel speed at right front speed sensor
• (0...255 km/h)</td></tr>
<tr><td></td><td colspan="4">Wheel speed at left front speed sensor
• (0...255 km/h)</td></tr>
</table>

Checking speed sensor

Display group number 002

- Press keys 0, 0 and 2.
- Confirm entry with key Q.
- There are always 4 display zones -arrows- in the measured value block. Decoding the individual values in display zones 1 to 4 can be read-off from the following tables.

Fig. 191: V.A.G 1551 Scan Tool Display - Checking Speed Sensor (1 Of 2)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display: (vehicle stationary)

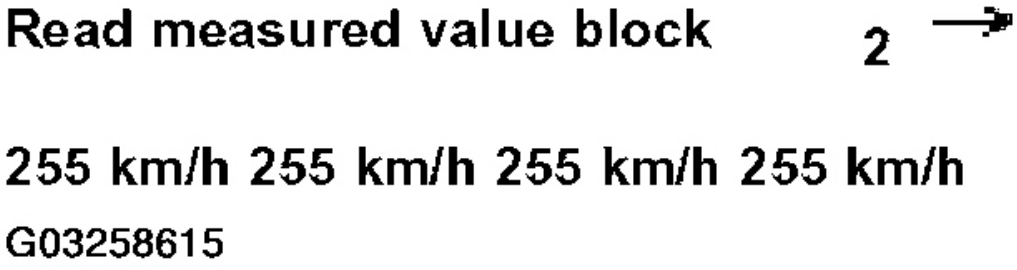


Fig. 192: V.A.G 1551 Scan Tool Display - Checking Speed Sensor (2 Of 2)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Press C key for the next display group number entry.

If the --> key is pressed, keys 0 and 8 for work sequence "Read measured value block" must be pressed again afterwards to regain entry.

NOTE: **For display group number 002 remember: The reading of measured value blocks in display group number 002 must be undertaken when driving off slowly. Then the ABS control module (w/EDL) -J104- will store the first usable voltage signals provided by the speed sensors and display these as a fixed value in the measured value block.**

DISPLAY GROUP NUMBER: 002

<table>
<tr><td colspan="3">Read measured value block</td><td>2 --></td><td>Display group number: 002</td></tr>
<tr><td>3 km/h(1)</td><td>6 km/h(1)</td><td>2 km/h(2)</td><td>1 km/h(2)</td><td><- - Indicated on display: (when driving off slowly)</td></tr>
<tr><td></td><td></td><td></td><td></td><td>Wheel speed at right rear speed sensor
• (0...255 km/h)</td></tr>
<tr><td></td><td></td><td></td><td colspan="2">Wheel speed at left rear speed sensor
• (0...255 km/h)</td></tr>
<tr><td></td><td></td><td colspan="3">Wheel speed at right front speed sensor
• (0...255 km/h)</td></tr>
<tr><td></td><td colspan="4">Wheel speed at left front speed sensor
• (0...255 km/h)</td></tr>
<tr><td colspan="5">(1) If the deviations in display zones 1 and 2 are greater than 6 km/h (approx. 3.75 mph), the following malfunctions may be present:
(2) If the deviations in display zones 3 and 4 are greater than 2 km/h (approx. 1.25 mph), the following malfunctions may be present. Air gap between speed sensor and rotor may be too big: Check that speed sensor is screwed correctly to wheel bearing housing. Speed sensor or rotor exterior damaged: Change damaged component.</td></tr>
</table>

Checking brake light switch, brake system warning lamp, ABS warning lamp and ASR/ESP warning light

Display group number 003

- Press keys 0, 0 and 3
- Confirm entry with key Q.
- There are always 4 display zones -arrows- in the measured value block. Decoding the individual values in display zones 1 to 4 can be read-off from the following tables.

Fig. 193: V.A.G 1551 Scan Tool Display - Checking Brake Light Switch (1 Of 2)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display: (vehicle stationary)

Press C key for the next display group number entry.

If the --> key is pressed, keys 0 and 8 for work sequence "Read measured value block" must be pressed again afterward to regain entry.

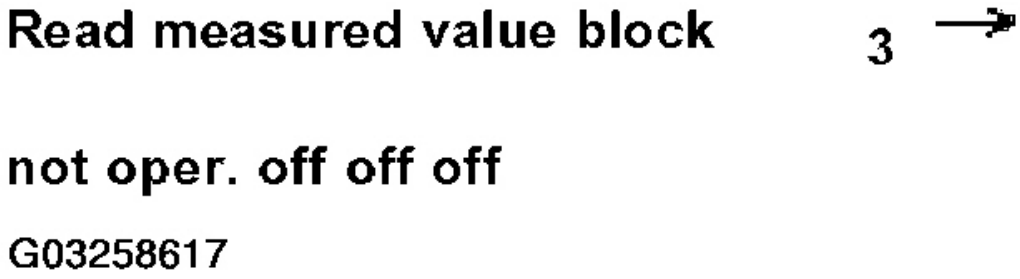


Fig. 194: V.A.G 1551 Scan Tool Display - Checking Brake Light Switch (2 Of 2)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

DISPLAY GROUP NUMBER: 003

Read measured value block			3 -->	**Display group number: 003**
not oper.	off	off	off	< - - Indicated on display
				ASR/ESP warning light • off • on

			ABS warning light (1) • off • on
		Brake system warning light(1) • off • on	
	Brake light switch: • not oper. --> Brake pedal not depressed • operated --> Brake pedal depressed If "not oper." is indicated on the V.A.G 1551 display despite foot brake being depressed or "operated", despite foot brake not being depressed, perform test step No. 4 of electrical check, see **ELECTRICAL TEST OF MARK 60, VEHICLES FROM M.Y. 10.00** . It is also possible that the brake light switch is not correctly adjusted --> Adjusting brake light switch, see **ADJUSTING BRAKE LIGHT SWITCH** .		
(1) During the diagnosis the ABS warning Light for -K47- and for Warning light for brake system -K118- will flash.			

Checking steering angle sender, lateral acceleration sender and yaw rate sender.

NOTE: This test is for models with ABS/EDL/ASR/ESP only.

Display group number 004

- Press keys 0, 0 and 4
- Confirm entry with key Q.
- There are always 3 display zones -arrows- in the measured value block. Decoding the individual values in display zones 1 to 3 can be read-off from the following tables.

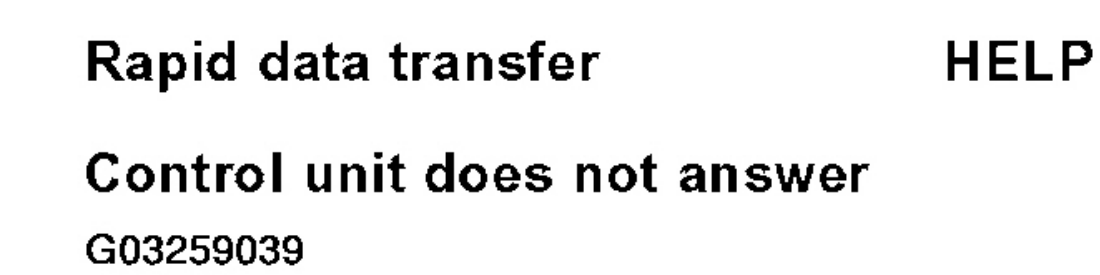


Fig. 195: V.A.G 1551 Scan Tool Display - Checking Steering Angle Sender (1 Of 2)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display: e.g. (vehicle stationary)

Press C key for the next display group number entry.

If the --> key is pressed, keys 0 and 8 for work sequence "Read measured value block" must be pressed again afterwards to regain entry.

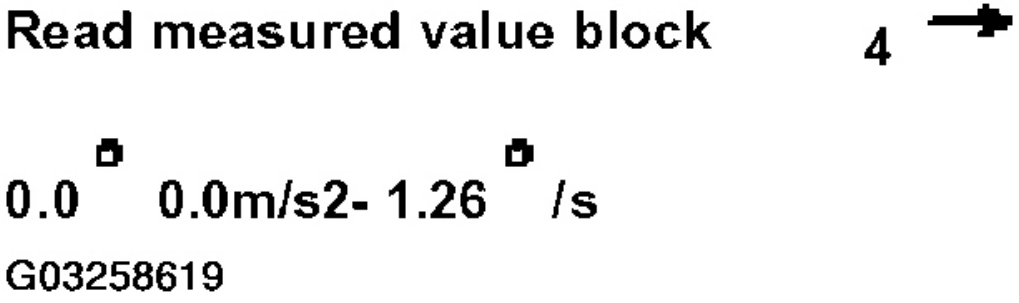


Fig. 196: V.A.G 1551 Scan Tool Display - Checking Steering Angle Sender (2 Of 2)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

DISPLAY GROUP NUMBER: 004

Read measured value block			4 -->	**Display group number: 004**
0.0°	0.0m/s^{2-}	1.26° /s		<- - Indicated on display (example)
				Vacant

			Sender for rotation rate: • Specification when vehicle is stationary:+/- 2.5° /s • Perform electrical check from, see **ELECTRICAL TEST OF MARK 60, VEHICLES FROM M.Y. 10.00**
		Sensor for transverse acceleration: • Specification when vehicle stationary:+/- 1.5m/s^2 • Specification at full lock and travelling at 20 km/h (12.5 mph) in a left-hand curve: the measure values increase steadily. • Specification at full lock and travelling at 20 km/h (12.5 mph) in a right-hand curve: the measure values increase steadily with a negative (-) prefix. • Checking lateral acceleration sender -G200-, see **CHECKING SENSOR FOR TRANSVERSE ACCELERATION -G200- 1)** • Perform electrical test, see from, see **ELECTRICAL TEST OF MARK 60, VEHICLES FROM M.Y. 10.00**	
	Steering angle sensor: • If the steering angle sensor -G85- is tested during straight-ahead travel, then zero compensation must also be performed.(1) • Specification at straight ahead +/-4.5° • Perform electrical checks from, see **ELECTRICAL TEST OF MARK 60, VEHICLES FROM M.Y. 10.00** ○ Initiate basic setting, see **INITIATING BASIC SETTING** Display group number 060		

(1) During a test drive with the V.A.G 1551 scan tool or tester VAS 5051 connected and in "Diagnosis" or "Measured value block", there is no ABS or ESP regulation. The ABS or ESP warning lights will flash. The OBD of ABS control module (w/EDL) -J104- is terminated when a speed of 20 km/h (13 mph) is exceeded.

Checking sensor for transverse acceleration -G200- 1)

- Remove sensor for transverse acceleration -G200-. Do not pull connector off sensor for transverse acceleration -G200- when doing this.

  See **ESP SYSTEM COMPONENTS, REMOVING AND INSTALLING** .

  NOTE: All functions that have so far been carried out with V.A.G 1551 can now also be carried out with the tester VAS 5051.

- Connect scan tool V.A.G 1551.

  The sensor for transverse acceleration -G200- can be checked with the help of function "Read measured

value block", display group number 005.

- In read measured value block there are 3 display zones -arrows-. The values for the sensor for transverse acceleration -G200- are displayed in display zone 2.

Fig. 197: V.A.G 1551 Scan Tool Display - Checking Sensor For Transverse Acceleration -G200- 1 (1 Of 2)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display: e.g. (vehicle stationary)

1) With ABS/EDL/ASR/ESP only.

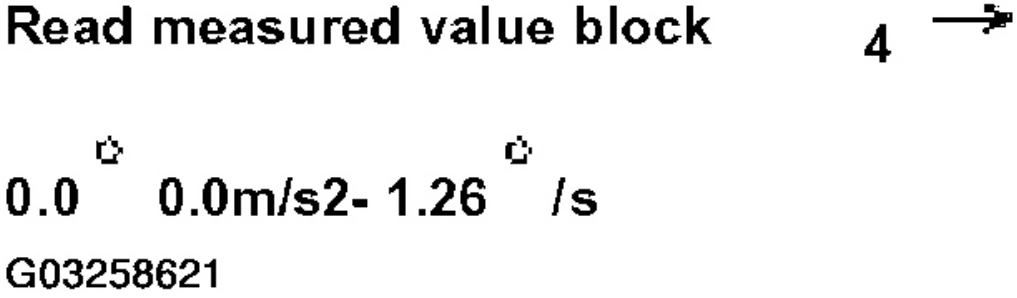


Fig. 198: V.A.G 1551 Scan Tool Display - Checking Sensor For Transverse Acceleration -G200- 1 (2 Of 2)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Turn 90° to right of installation position (see illustration).

- Shown on display in display zone 2 (when vehicle stationary) e.g. -9.8 +/-1 m/s^2

  A negative result equates to the forces during a right-hand turn.

- Turn it 90° to left relative to installation position (see illustration).
- Shown on display in display zone 2 (when vehicle stationary) e.g. 9.8 +/-1 m/s^2 .

  A positive result equates to the forces during a left-hand turn.

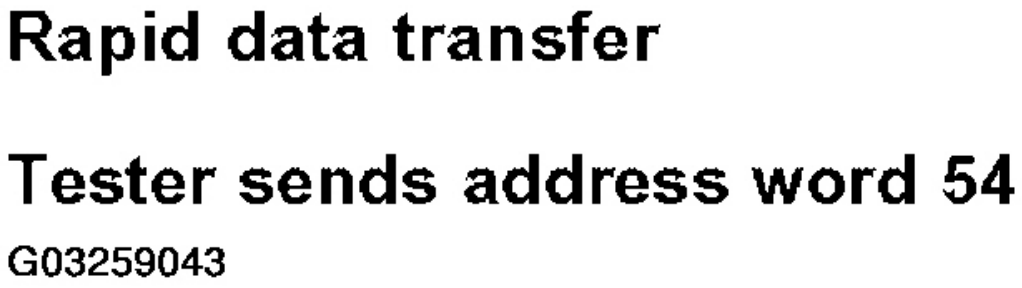


Fig. 199: Turning 90° To Right Of Installation Position (Sensor For Transverse Acceleration)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Checking brake pressure sensor

This test is for models with ABS/EDL/ASR/ESP only.

Display group number 005

- Press keys 0, 0 and 5
- Confirm entry with key Q.
- There are always 4 display zones -arrows- in the measured value block. Decoding the individual values in display zones 1 to 4 can be read-off from the following tables.

Fig. 200: V.A.G 1551 Scan Tool Display - Checking Brake Pressure Sensor1 (1 Of 2)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display: e.g. (vehicle stationary)

Press C key for the next display group number entry.

If the --> key is pressed, keys 0 and 8 for work sequence "Read measured value block" must be pressed again afterward to regain entry.

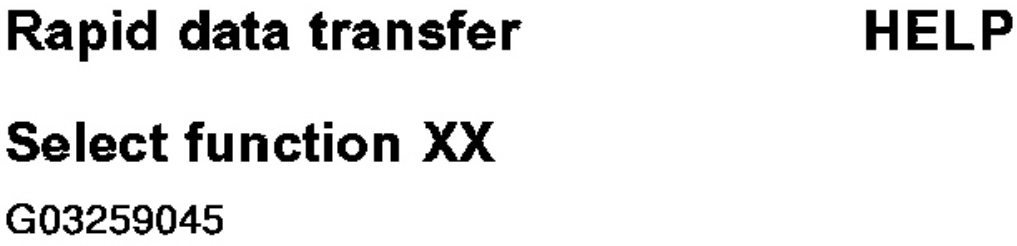


Fig. 201: V.A.G 1551 Scan Tool Display - Checking Brake Pressure Sensor1 (2 Of 2)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

DISPLAY GROUP NUMBER: 005

Read measured value block			5 -->	**Display group number: 005**
-1.06 bar				<- - Indicated on display (example)
				Vacant
			Vacant	
		Vacant		
	Brake pressure sensor • Specification when brake pedal is not depressed: +/- 7 bar			

	• Perform electrical check from, see **ELECTRICAL TEST OF MARK 60, VEHICLES FROM M.Y. 10.00**

Checking data bus wiring

Display group number 125

- Press keys 1, 2 and 5
- Confirm entry with key Q.
- There are always 4 display zones -arrows- in the measured value block. Decoding the individual values in display zones 1 to 4 can be read-off from the following tables.

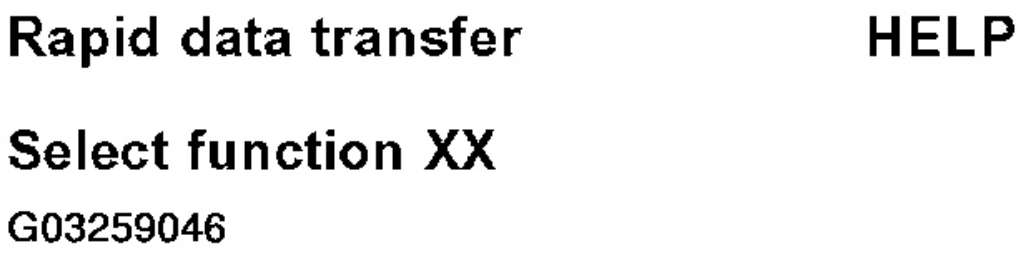


Fig. 202: V.A.G 1551 Scan Tool Display - Checking Data Bus Wiring (1 Of 2)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display: (when vehicle stationary)

Press C key for the next display group number entry.

If the --> key is pressed, keys 0 and 8 for work sequence "Read measured value block" must be pressed again afterwards to regain entry.

Rapid data transfer Q

01 - Interrogating control unit version

G03259047

Fig. 203: V.A.G 1551 Scan Tool Display - Checking Data Bus Wiring (2 Of 2)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

DISPLAY GROUP NUMBER: 125

Read measured value block			125 -->	**Display group number: 125**
Engine 1	St. ang. 1		Gear. 1	<- - Indicated on display (example)
				Data bus for Transmission(1) • 1 --> Data bus connection is available. • 0 --> Data bus connection is not available /()
			Vacant	
		Data bus for steering angle • 1 --> Data bus connection is available. • 0 --> Data bus connection is not available ()		
	Data bus for engine • 1 --> Data bus connection is available. • 0 --> Data bus connection is not available (2)			

(1) Vehicles with an automatic transmission only, see check for relevant transmission code.

(2) Data bus connection is interrupted (open circuit) or data bus wiring is interchanged. See wiring diagram.

OUTPUT DIAGNOSTIC TEST MODE (DTM)

NOTE:

- **All functions which could previously be performed with V.A.G 1551 can now also be carried out with the tester VAS 5051.**

The pump motor and the correct functioning of the hydraulic circuits (allocation of brake lines to wheel

cylinders and function of valves) can be checked via the final control diagnosis for interchange or leaks.

NOTE:

- **The vehicle must be raised until all wheels are free to turn. (2nd mechanic required to rotate wheels)**
- **The -C- key can be used to exit the test sequence at any time.**
- **After depressing the brake pedal several times the vacuum in the brake booster will be exhausted. Therefore more pressure must be applied to the brake pedal in order to attain the same fluid pressure in brake system, as that attained with vacuum.**
- **When vacuum in brake booster is exhausted it can happen that the wheels do not lock; start engine and build-up vacuum in brake booster.**

Example:

Indicated on V.A.G 1551 display during final control diagnosis:

(e.g. front left wheel, FL)

FRONT LEFT WHEEL

Final control diagnosis - ->
IFL: VBAT OFL: 0V Wheel FL locked

IFL = Inlet valve Front Left

VBAT = Voltage Battery; Voltage at valve

OFL = Outlet valve Front Left

0V = 0 Volt; No voltage at valve

Locked/free = Wheel condition; must be checked by 2nd mechanic if required

WHEEL CONDITION

Final control diagnosis - ->
EDL valves/Hyd-P: VBAT Wheel FL/FR locked

Hydr-P = Hydraulic pump

- Connect V.A.G 1551 scan tool.
- Switch ignition on.
- Press key -1- for "Rapid data transfer" operating mode.
- Select brake electronics control module (address word 03); see **LIST OF SELECTABLE FUNCTIONS** .

Indicated on display:

- Confirm entry with key Q.

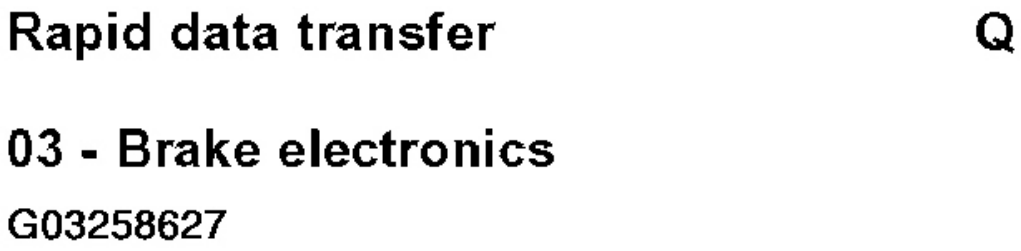


Fig. 204: V.A.G 1551 Scan Tool Display - Initiating On Board Diagnosis Test Mode (1 Of 35)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

NOTE: During the next work steps the ABS warning light -K47- flashes.

- Read off control module version in V.A.G 1551 display.
- Press --> key.

Indicated on display

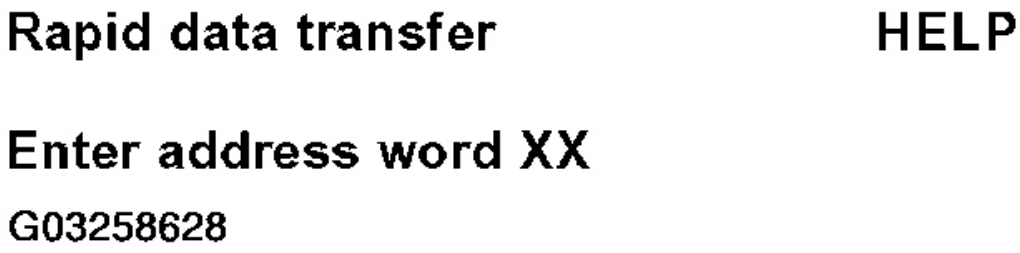


Fig. 205: V.A.G 1551 Scan Tool Display - Initiating On Board Diagnosis Test Mode (2 Of 35)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Press keys 0 and 3

Indicated on display

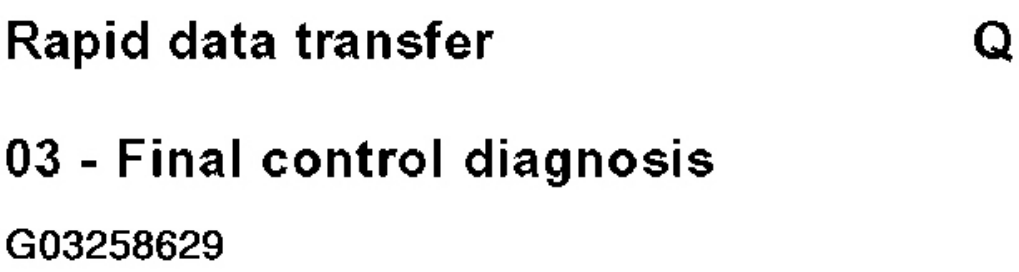


Fig. 206: V.A.G 1551 Scan Tool Display - Initiating On Board Diagnosis Test Mode (3 Of 35)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Confirm entry with key Q.

  ABS hydraulic pump -V64- must run.

Indicated on display

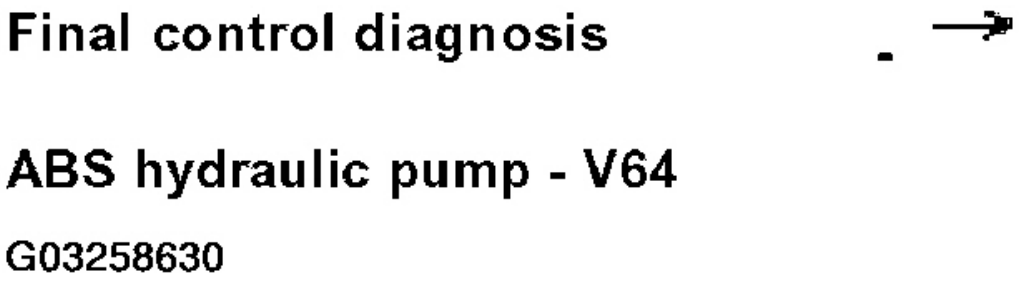


Fig. 207: V.A.G 1551 Scan Tool Display - Initiating On Board Diagnosis Test Mode (4 Of 35)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Press --> key.

Indicated on display

Fig. 208: V.A.G 1551 Scan Tool Display - Initiating On Board Diagnosis Test Mode (5 Of 35)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Operate brake pedal.
- Press --> key.

Indicated on display

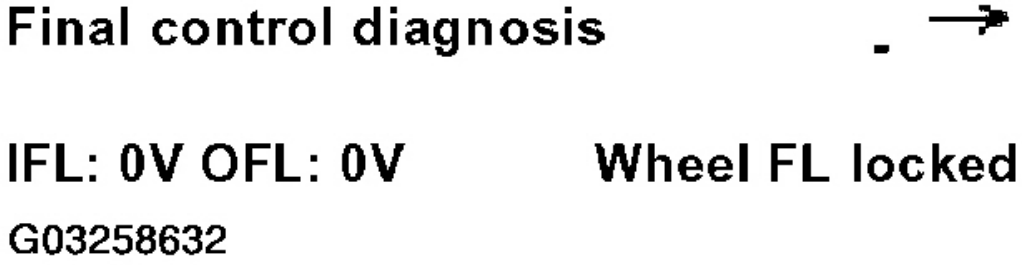


Fig. 209: V.A.G 1551 Scan Tool Display - Initiating On Board Diagnosis Test Mode (6 Of 35)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Indicate to 2nd mechanic which wheel requires turning by hand.

NOTE: If the wheel does not lock, there is a possibility that there is a malfunction in the mechanical/hydraulic part of the brake system.

- Press-> key.

Indicated on display

- Press --> key.

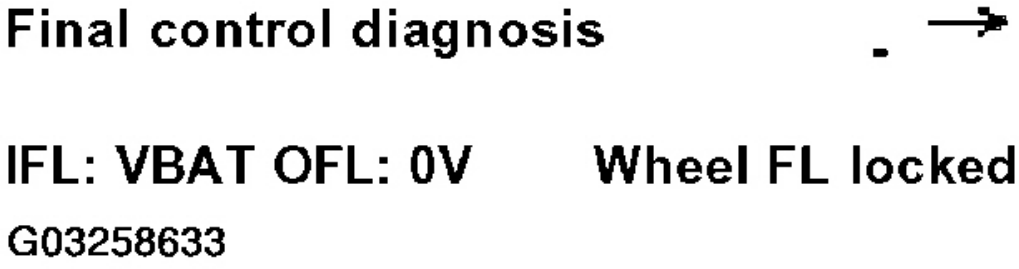


Fig. 210: V.A.G 1551 Scan Tool Display - Initiating On Board Diagnosis Test Mode (7 Of 35)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

ABS hydraulic pump -V64- must run.

Brake pedal must not give.

If the brake pedal gives, there is a malfunction in the hydraulic unit. In this case the hydraulic unit must be replaced. See **CONTROL MODULE AND HYDRAULIC UNIT, REMOVING AND INSTALLING** .

Indicated on display

- Indicate to 2nd mechanic which wheel requires turning by hand.

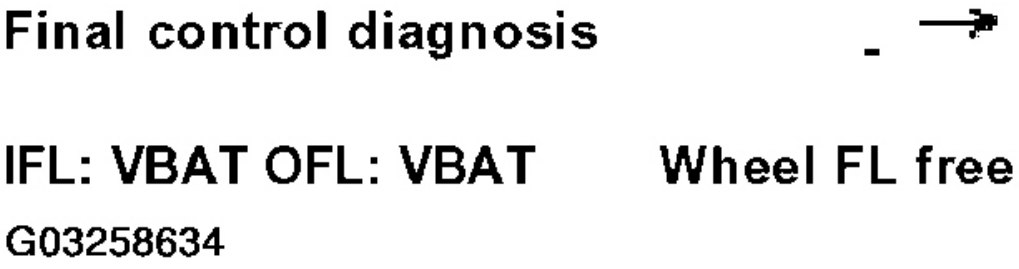


Fig. 211: V.A.G 1551 Scan Tool Display - Initiating On Board Diagnosis Test Mode (8 Of 35)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

NOTE: If the wheel locks there is a possibility that the brake lines to the wheel calipers/cylinders have been interchanged.

- Press --> key.

  ABS hydraulic pump -V64- no longer runs.

Indicated on display

- Press --> key.

  Brake pedal must give perceptibly

If the brake pedal does not give, there is a malfunction in the hydraulic unit. In this case the hydraulic unit must be replaced. See **CONTROL MODULE AND HYDRAULIC UNIT, REMOVING AND INSTALLING** .

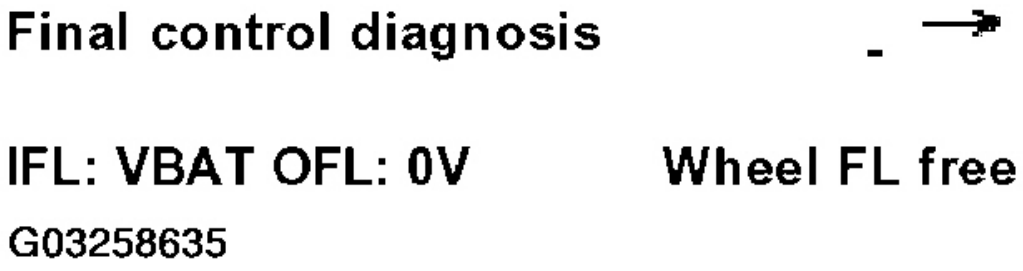


Fig. 212: V.A.G 1551 Scan Tool Display - Initiating On Board Diagnosis Test Mode (9 Of 35)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

- Indicate to 2nd mechanic which wheel requires turning by hand.

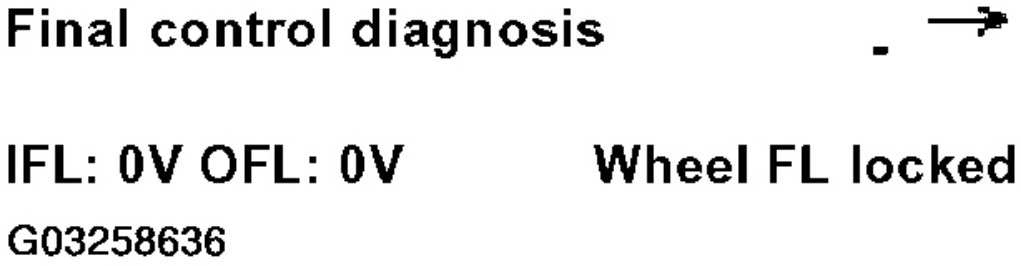


Fig. 213: V.A.G 1551 Scan Tool Display - Initiating On Board Diagnosis Test Mode (10 Of 35)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

NOTE: If the wheel does not lock, there is a possibility that there is a malfunction in the mechanical/hydraulic part of the brake system.

- Press --> key.

Indicated on display

- Remove foot from brake pedal.
- Press --> key.

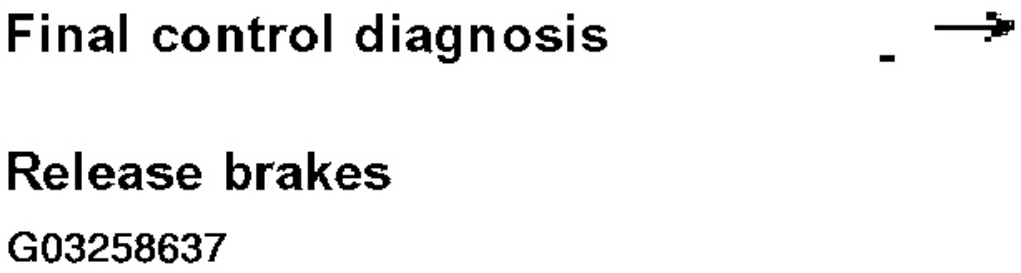


Fig. 214: V.A.G 1551 Scan Tool Display - Initiating On Board Diagnosis Test Mode (11 Of 35)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

- Operate brake pedal.
- Press --> key.

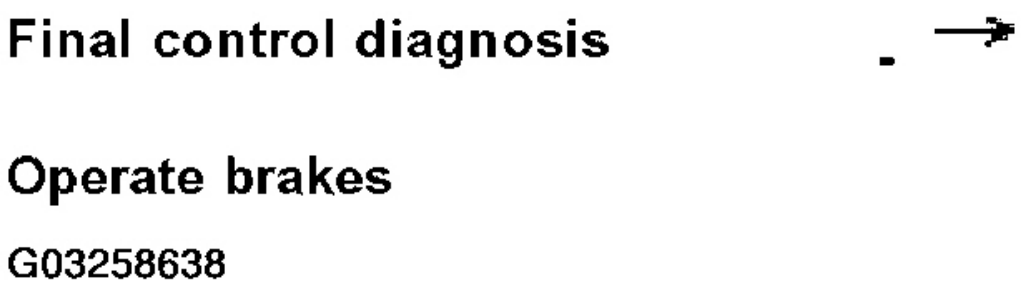


Fig. 215: V.A.G 1551 Scan Tool Display - Initiating On Board Diagnosis Test Mode (12 Of 35)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

- Indicate to 2nd mechanic which wheel requires turning by hand.

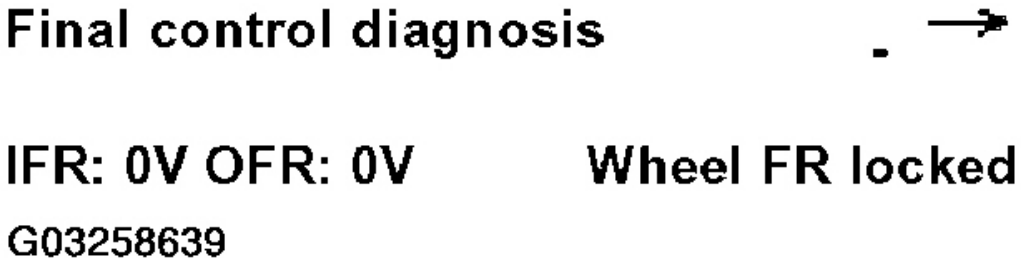


Fig. 216: V.A.G 1551 Scan Tool Display - Initiating On Board Diagnosis Test Mode (13 Of 35)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

NOTE: If the wheel does not lock, there is a possibility that there is a malfunction in the mechanical/hydraulic part of the brake system.

- Press --> key.

Indicated on display

- Press --> key.

  ABS hydraulic pump -V64- must run.

  Brake pedal must not give

If the brake pedal gives, there is a malfunction in the hydraulic unit. In this case the hydraulic unit must be replaced.

See **CONTROL MODULE AND HYDRAULIC UNIT, REMOVING AND INSTALLING** .

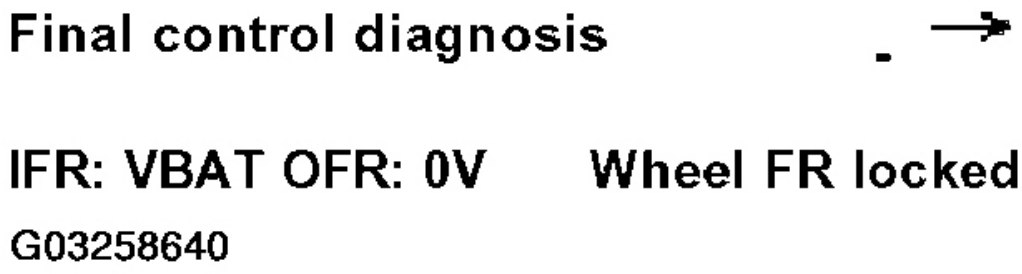


Fig. 217: V.A.G 1551 Scan Tool Display - Initiating On Board Diagnosis Test Mode (14 Of 35)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

- Indicate to 2nd mechanic which wheel requires turning by hand.

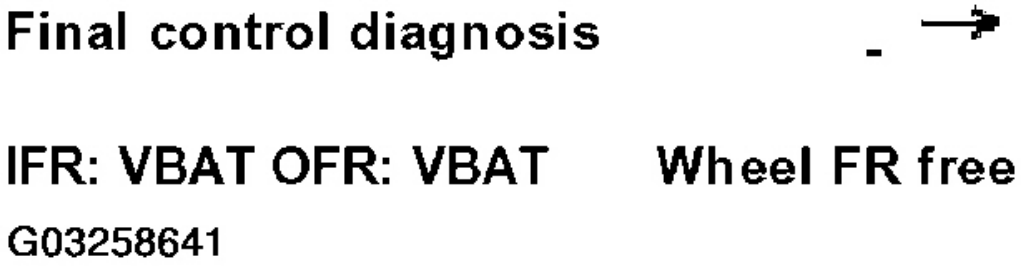


Fig. 218: V.A.G 1551 Scan Tool Display - Initiating On Board Diagnosis Test Mode (15 Of 35)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

NOTE: If the wheel locks there is a possibility that the brake lines to the wheel calipers/cylinders have been interchanged.

Press --> key.

ABS hydraulic pump -V64- no longer runs.

Indicated on display

- Press --> key.

  Brake pedal must give perceptibly

If the brake pedal does not give, there is a malfunction in the hydraulic unit. In this case the hydraulic unit must be replaced.

See **CONTROL MODULE AND HYDRAULIC UNIT, REMOVING AND INSTALLING** .

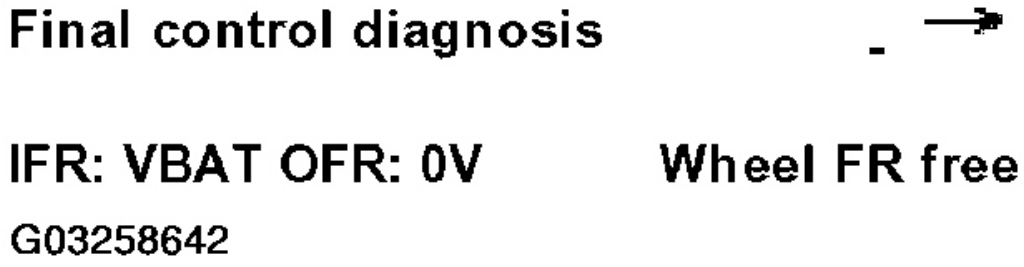


Fig. 219: V.A.G 1551 Scan Tool Display - Initiating On Board Diagnosis Test Mode (16 Of 35)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

- Indicate to 2nd mechanic which wheel requires turning by hand.

If the wheel does not lock, there is a possibility that there is a malfuncton in the mechanical/hydraulic part of the brake system.

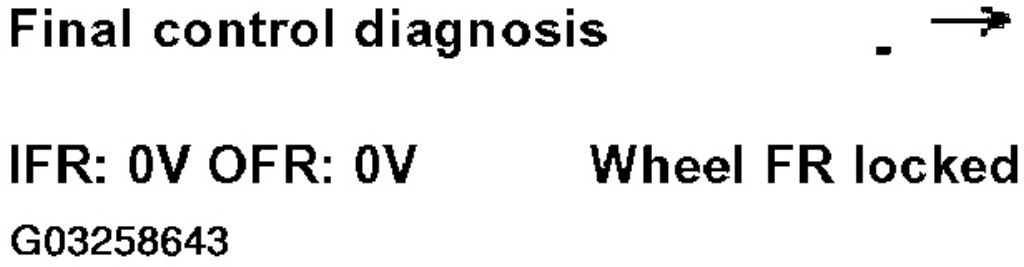


Fig. 220: V.A.G 1551 Scan Tool Display - Initiating On Board Diagnosis Test Mode (17 Of 35)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Press --> key.

Indicated on display

- Remove foot from brake pedal.

- Press --> key.

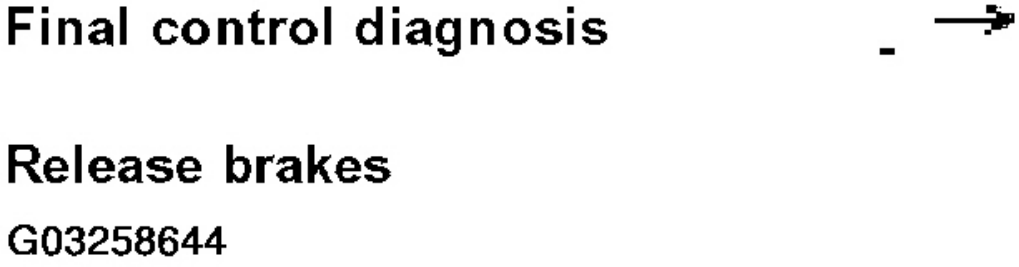


Fig. 221: V.A.G 1551 Scan Tool Display - Initiating On Board Diagnosis Test Mode (18 Of 35)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

- Operate brake pedal.
- Press --> key.

Fig. 222: V.A.G 1551 Scan Tool Display - Initiating On Board Diagnosis Test Mode (19 Of 35)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

- Indicate to 2nd mechanic which wheel requires turning by hand.

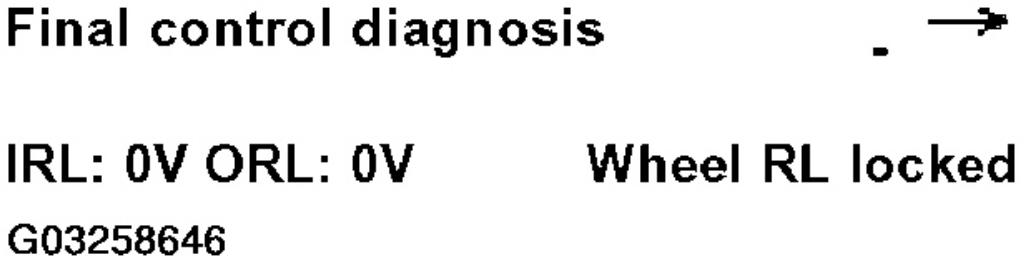


Fig. 223: V.A.G 1551 Scan Tool Display - Initiating On Board Diagnosis Test Mode (20 Of 35)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

NOTE: If the wheel does not lock, there is a possibility that there is a malfunction in the mechanical/hydraulic part of the brake system.

- Press --> key.

Indicated on display

- Press --> key.

ABS hydraulic pump -V64- must run.

Brake pedal must not give

If the brake pedal gives, there is a malfunction in the hydraulic unit. In this case the hydraulic unit must be replaced.

See **CONTROL MODULE AND HYDRAULIC UNIT, REMOVING AND INSTALLING** .

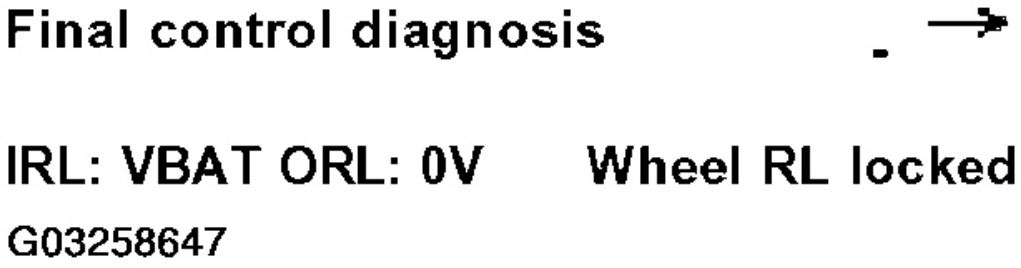


Fig. 224: V.A.G 1551 Scan Tool Display - Initiating On Board Diagnosis Test Mode (21 Of 35)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

- Indicate to 2nd mechanic which wheel requires turning by hand.

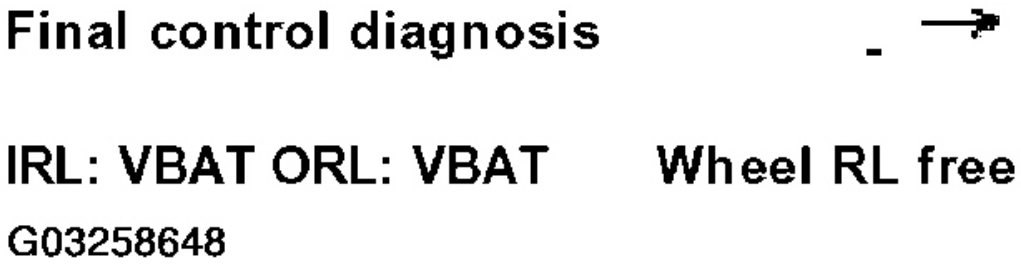


Fig. 225: V.A.G 1551 Scan Tool Display - Initiating On Board Diagnosis Test Mode (22 Of 35)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

NOTE: If the wheel locks there is a possibility that the brake lines to the wheel calipers/cylinders have been interchanged.

- Press --> key.

ABS hydraulic pump -V64- no longer runs.

Indicated on display

- Press --> key.

  Brake pedal must give perceptibly

  If the brake pedal does not give, there is a malfunction in the hydraulic unit. In this case the hydraulic unit must be replaced.

  See **CONTROL MODULE AND HYDRAULIC UNIT, REMOVING AND INSTALLING** .

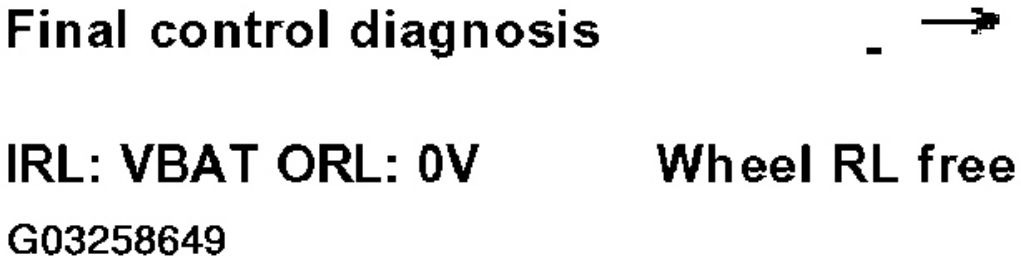


Fig. 226: V.A.G 1551 Scan Tool Display - Initiating On Board Diagnosis Test Mode (23 Of 35)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

- Indicate to 2nd mechanic which wheel requires turning by hand.

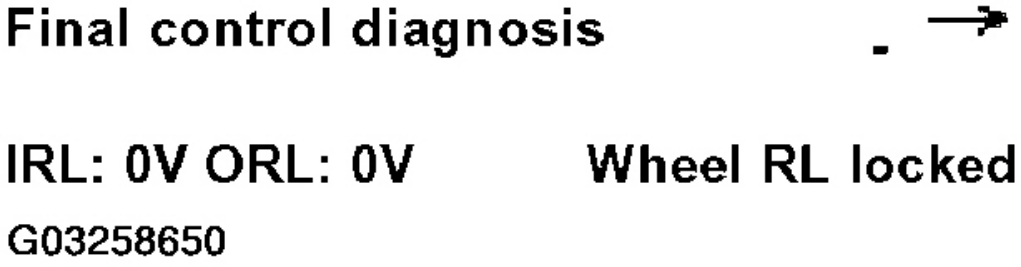


Fig. 227: V.A.G 1551 Scan Tool Display - Initiating On Board Diagnosis Test Mode (24 Of 35)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

NOTE: If the wheel does not lock, there is a possibility that there is a malfunction in the mechanical/hydraulic part of the brake system.

- Press --> key.

Indicated on display

- Remove foot from brake pedal.
- Press --> key.

Fig. 228: V.A.G 1551 Scan Tool Display - Initiating On Board Diagnosis Test Mode (25 Of 35)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

- Operate brake pedal.
- Press --> key.

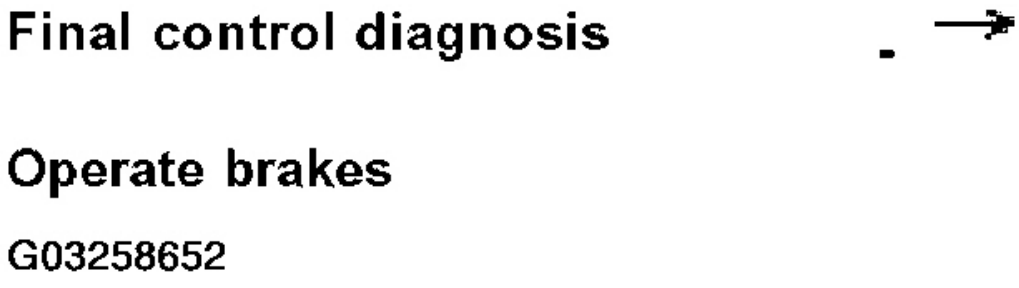


Fig. 229: V.A.G 1551 Scan Tool Display - Initiating On Board Diagnosis Test Mode (26 Of 35)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

- Indicate to 2nd mechanic which wheel requires turning by hand.

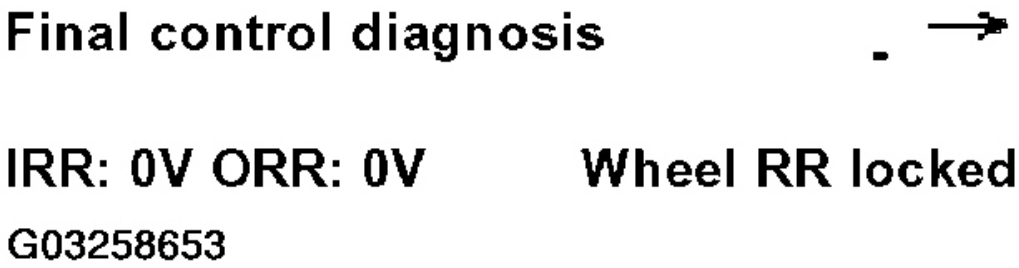


Fig. 230: V.A.G 1551 Scan Tool Display - Initiating On Board Diagnosis Test Mode (27 Of 35)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

NOTE: If the wheel does not lock, there is a possibility that there is a malfunction in the mechanical/hydraulic part of the brake system.

- Press --> key.

  Indicated on display

- Press --> key.

ABS hydraulic pump -V64- must run.

Brake pedal must not give

If the brake pedal gives, there is a malfunction in the hydraulic unit. In this case the hydraulic unit must be replaced.

See

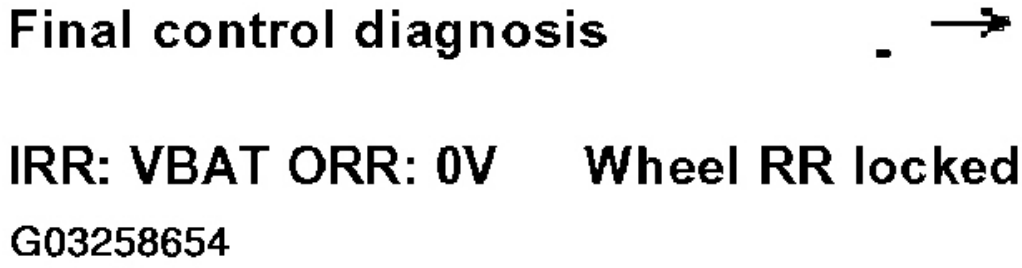


Fig. 231: V.A.G 1551 Scan Tool Display - Initiating On Board Diagnosis Test Mode (28 Of 35)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

- Indicate to 2nd mechanic which wheel requires turning by hand.

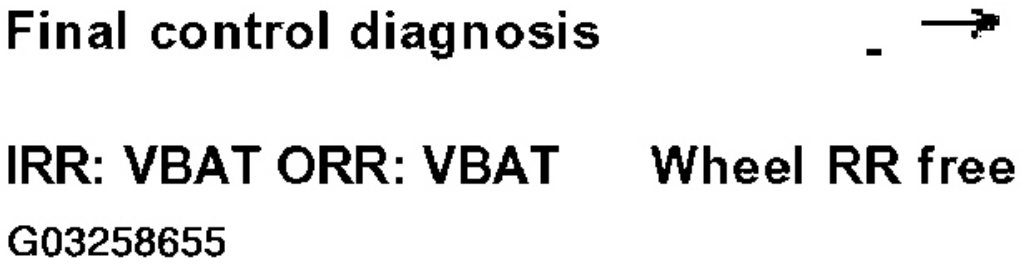


Fig. 232: V.A.G 1551 Scan Tool Display - Initiating On Board Diagnosis Test Mode (29 Of 35)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

NOTE: If the wheel locks there is a possibility that the brake lines to the wheel calipers/cylinders have been interchanged.

- Press --> key.

ABS hydraulic pump -V64- no longer runs.

Indicated on display

- Press --> key.

Brake pedal must give perceptibly

If the brake pedal does not give, there is a malfunction in the hydraulic unit. In this case the hydraulic unit must be replaced.

See **CONTROL MODULE AND HYDRAULIC UNIT, REMOVING AND INSTALLING** .

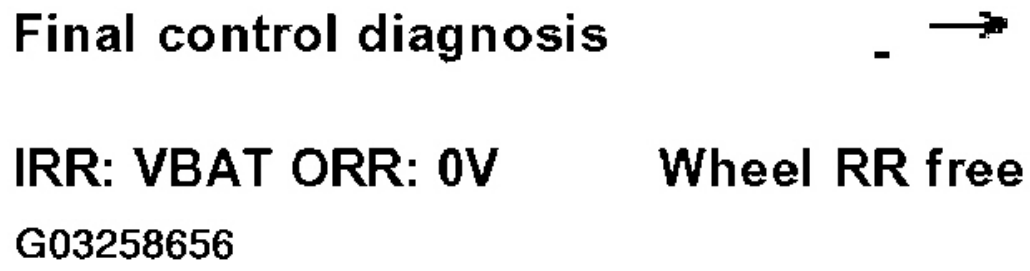


Fig. 233: V.A.G 1551 Scan Tool Display - Initiating On Board Diagnosis Test Mode (30 Of 35)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

- Indicate to 2nd mechanic which wheel requires turning by hand.

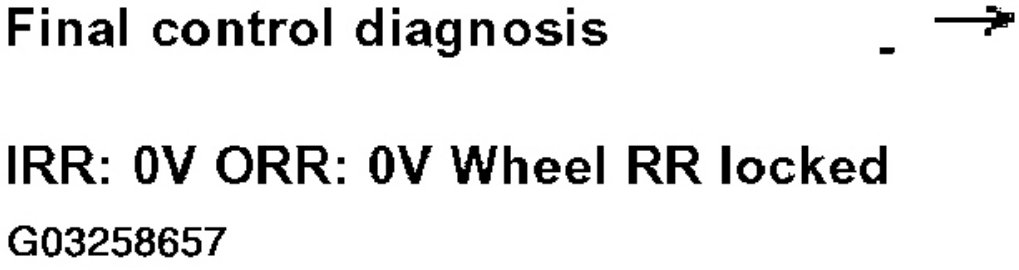


Fig. 234: V.A.G 1551 Scan Tool Display - Initiating On Board Diagnosis Test Mode (31 Of 35)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

NOTE: If the wheel does not lock, there is a possibility that there is a malfunction in the mechanical/hydraulic part of the brake system.

- Press --> key.

Indicated on display

- Remove foot from brake pedal.
- Press --> key.

Fig. 235: V.A.G 1551 Scan Tool Display - Initiating On Board Diagnosis Test Mode (32 Of 35)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

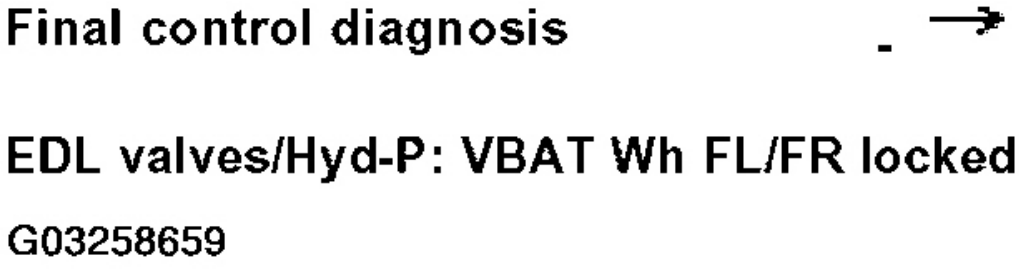


Fig. 236: V.A.G 1551 Scan Tool Display - Initiating On Board Diagnosis Test Mode (33 Of 35)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- A 2nd mechanic is required to rotate the respective wheel by hand.

If the wheels do not lock, there is a malfunction in the hydraulic part of the ABS system. In this case the hydraulic unit must be replaced.

See **CONTROL MODULE AND HYDRAULIC UNIT, REMOVING AND INSTALLING** .

- Press --> key.

The ABS warning light -K47- goes out.

Indicated on display

The final control diagnosis is completed

- Press --> key.

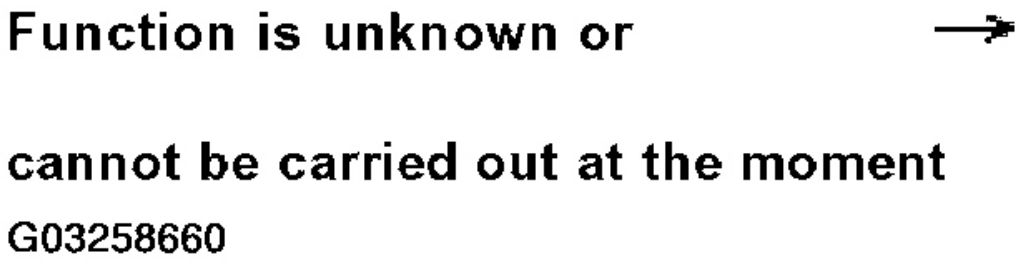


Fig. 237: V.A.G 1551 Scan Tool Display - Initiating On Board Diagnosis Test Mode (34 Of 35)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display

- *There is a malfunction in the system if the ABS warning light -K47- does not go out.*
- *Adhere exactly to test sequence: First check DTC memory, then erase.*

- End output (Function 06), see **DIAGNOSTIC TROUBLE CODE (DTC) ERASING MEMORY, ENDING OUTPUT** .

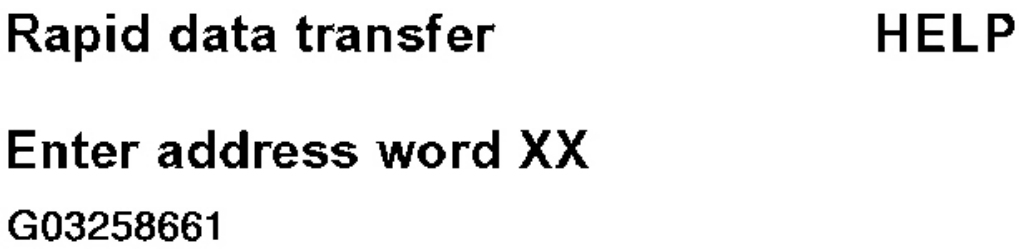


Fig. 238: V.A.G 1551 Scan Tool Display - Initiating On Board Diagnosis Test Mode (35 Of 35)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

INITIATING BASIC SETTING

Function 04 "Initiate basic setting" performs several functions with ABS Mark 60:

- Display group number 001 is required only to bleed the hydraulic system, see **DISPLAY GROUP NUMBER 01: BLEEDING HYDRAULIC UNIT**

NOTE:

- ***The basic setting is only necessary to bleed the hydraulic unit if at least one chamber of the brake fluid reservoir has completely run dry.***
- **Display group number 060[1]) is required to perform a zero compensation of steering angle sensor -G85-, see DISPLAY GROUP NUMBER 60: ZERO COMPENSATION OF STEERING ANGLE SENSOR -G85- . Then a driving test must be performed, see DISPLAY GROUP NUMBER 93: ACTIVATION OF ESP DRIVING TEST .**
- **Display group number 063[1]) is required to perform a zero compensation of sensor for transverse acceleration -G200-, see DISPLAY GROUP NUMBER 063: ZERO COMPENSATION OF SENSOR FOR TRANSVERSE ACCELERATION -G200- . Then a driving test must be performed, see DISPLAY GROUP NUMBER 93: ACTIVATION OF ESP DRIVING TEST .**
- **Display group number 066[1]) is required to perform a zero compensation of sender 1 for brake booster -G201-, see DISPLAY GROUP NUMBER 66: ZERO COMPENSATION FOR BRAKE PRESSURE SENDER 1 -G201- . Then a driving test must be performed, see DISPLAY GROUP NUMBER 93: ACTIVATION OF ESP DRIVING TEST .**

  1) With ABS/EDL/ASR/ESP only.

- **Display group number 093[1)] is required to perform the driving test, see**

DISPLAY GROUP NUMBER 93: ACTIVATION OF ESP DRIVING TEST . It is used to check the plausibility of the signals from steering angle sensor - G85-, Sensor for transverse acceleration -G200-, Sender for rotation rate - G202- and Sender 1 for brake booster -G201-.

[1] With ABS/EDL/ASR/ESP only.

When the ABS Control Module (w/EDL) -J104- is replaced, a zero compensation must be performed for the following components:

- Sensor for transverse acceleration -G200-.
- Steering angle sensor -G85-.
- Sender 1 for brake booster -G201-.

When replacing a sensor, only a zero compensation of the respective sensor must be performed.

Display group number 01: Bleeding hydraulic unit

Special tools and equipment

VAS 5234 Brake filler and bleeder unit

NOTE: All functions which could previously be performed with V.A.G 1551 can now also be carried out with the tester VAS 5051.

Bleeding hydraulic unit

- Connect brake filling and bleeder unit VAS 5234.
- Pre-bleed brake system

  See **BLEEDING BRAKE SYSTEM** .

- Connect V.A.G 1551 scan tool and select (address word 03) brake electronics control module with ignition switched on; see **LIST OF SELECTABLE FUNCTIONS** .

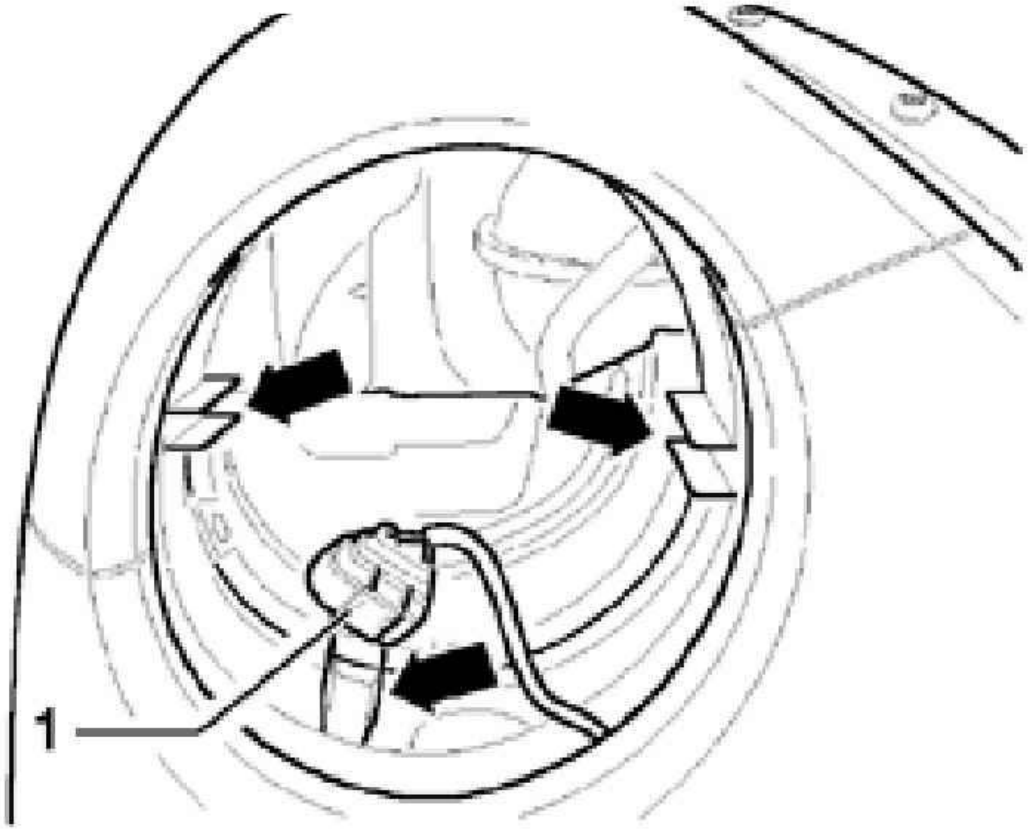


Fig. 239: Identifying VAS 5234 Brake Filler And Bleeder Unit
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display:

-
- Press keys 0 and 4. (The function "Initiating basic setting" is selected with 04).

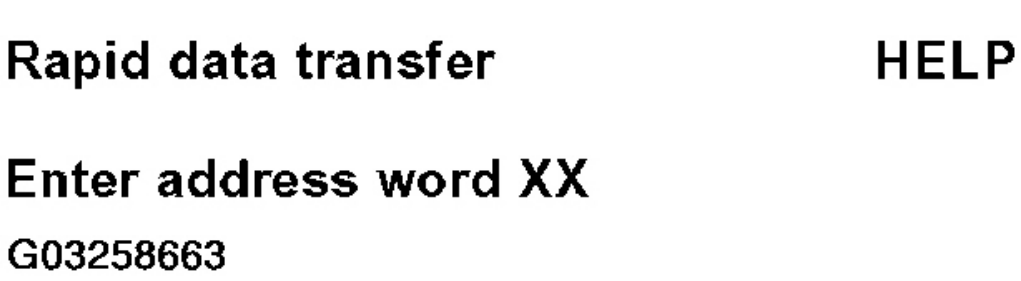


Fig. 240: V.A.G 1551 Scan Tool Display - Initiating Basic Setting (1 Of 40)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display:

- Confirm entry with key Q.

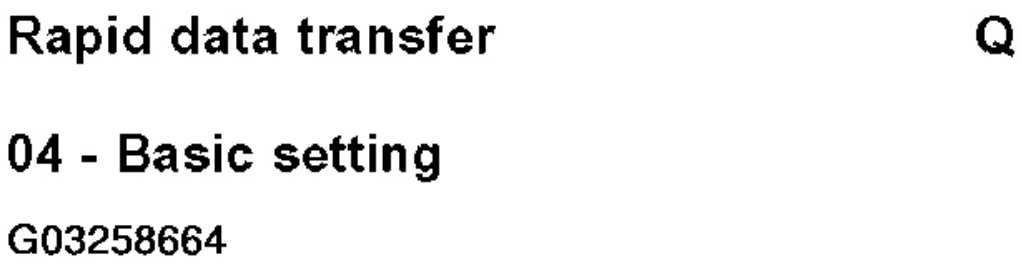


Fig. 241: V.A.G 1551 Scan Tool Display - Initiating Basic Setting (2 Of 40)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display:

- Press keys 0, 0 and 1
- Confirm entry with key Q.

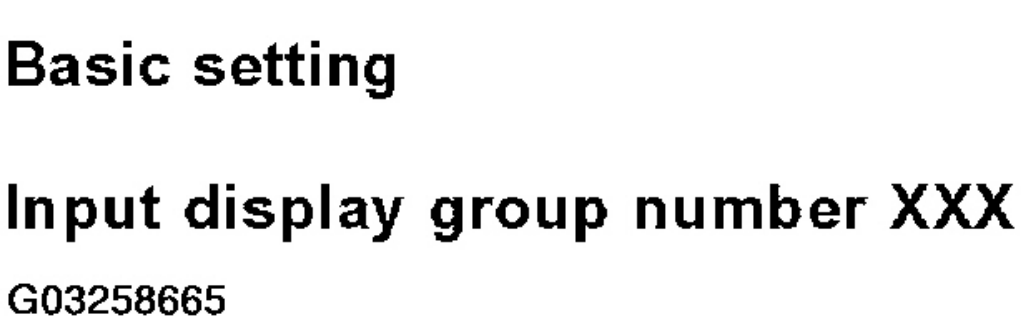


Fig. 242: V.A.G 1551 Scan Tool Display - Initiating Basic Setting (3 Of 40)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

The following cycle of steps must be repeated 8 times according to the basic setting prescribed by V.A.G 1551 or tester VAS 5051.

Indicated on display:

Operate pedal with substantial foot pressure and hold.

- Pedal moves down
- Hydraulic pump runs
- Pedal comes back

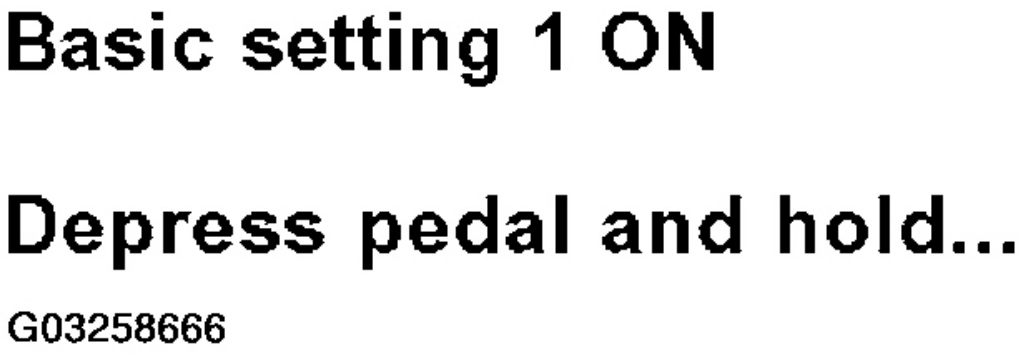


Fig. 243: V.A.G 1551 Scan Tool Display - Initiating Basic Setting (4 Of 40)

Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display:

- Press key 8

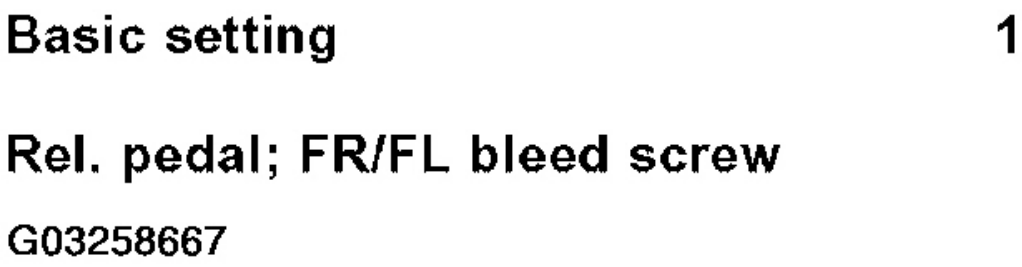


Fig. 244: V.A.G 1551 Scan Tool Display - Initiating Basic Setting (5 Of 40)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display:

Hydraulic pump runs

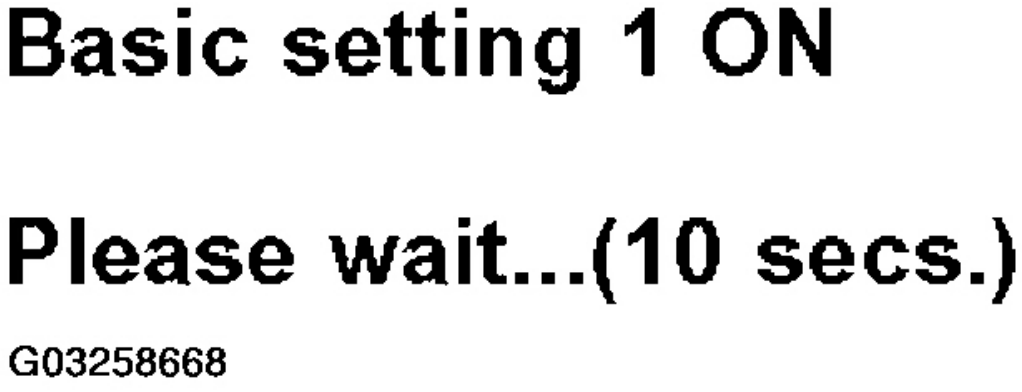


Fig. 245: V.A.G 1551 Scan Tool Display - Initiating Basic Setting (6 Of 40)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display:

- Press key 8

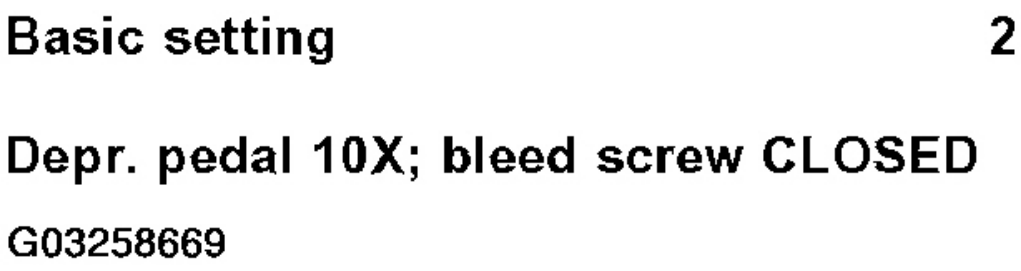


Fig. 246: V.A.G 1551 Scan Tool Display - Initiating Basic Setting (7 Of 40)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

When all 8 cycles have been performed, this message appears on the display:

- Press --> key.

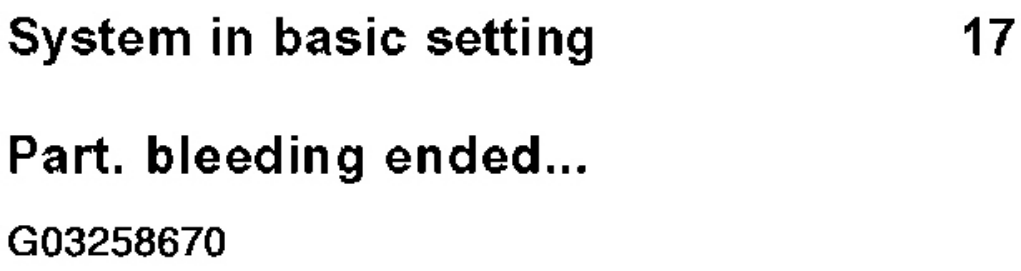


Fig. 247: V.A.G 1551 Scan Tool Display - Initiating Basic Setting (8 Of 40)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display:

- Press keys -0- and -6-, this ends the output.

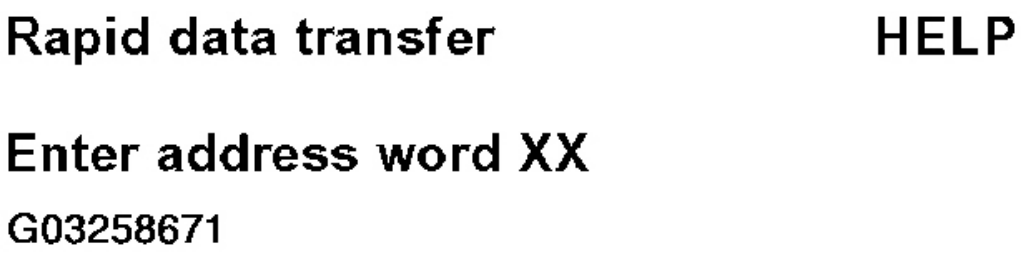


Fig. 248: V.A.G 1551 Scan Tool Display - Initiating Basic Setting (9 Of 40)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display:

- Confirm entry with Q key

Fig. 249: V.A.G 1551 Scan Tool Display - Initiating Basic Setting (10 Of 40)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

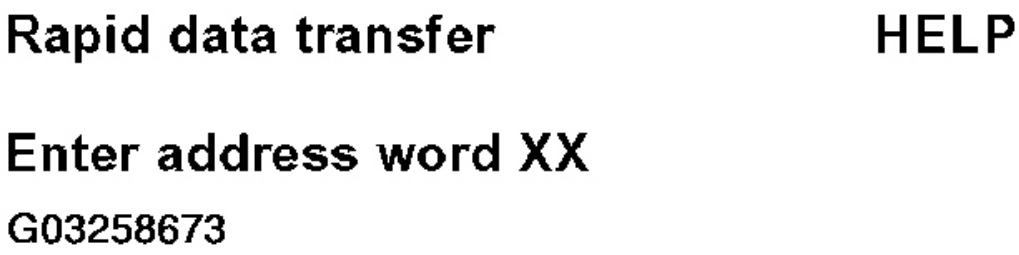
Indicated on display:

- Press C key
- Switch off ignition.
- Disconnect connection to V.A.G 1551 scan tool.

Bleed brake system.

See **BLEEDING BRAKE SYSTEM**

- Vehicles with ABS/EDL/ASR/ESP: Perform a zero compensation for sender 1 for brake booster -G201-, see **DISPLAY GROUP NUMBER 66: ZERO COMPENSATION FOR BRAKE PRESSURE SENDER 1 -G201-** .



G03258673

Fig. 250: V.A.G 1551 Scan Tool Display - Initiating Basic Setting (11 Of 40)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Display group number 60: zero compensation of steering angle sensor -G85-

All functions which could previously be performed with V.A.G 1551 can now also be carried out with the tester VAS 5051.

- Connect V.A.G 1551 scan tool and select (address word 03) brake electronics control module with ignition switched on; see **LIST OF SELECTABLE FUNCTIONS** .
- Start engine.
- Carry out a short test drive over a flat and level surface. Drive straight-ahead and not faster then 20 km/h (12.5 mph) and observe the following points:
- If the steering wheel is not in the straight-ahead position when driving during a test drive, then correct the steering wheel position within the frame work of an alignment test and make sure the steering wheel is in the straight-ahead position.

  See **SPECIFICATIONS & PROCEDURES** .

- Steering wheel straight during test drive, but vehicle moves off-line when moving straight-ahead.
- Check specifications with help of function 08 "Read measured value block" see **MEASURED VALUE BLOCK, READING** , Display group number 004.

NOTE: Make sure steering wheel does not moved. Do not turn ignition switch off!

- First perform function 11 "Login procedure" successfully using V.A.G 1551 scan tool, see **LOGIN PROCEDURE** .

Indicated on display:

- Press keys 0 and 4. (The function "Initiating basic setting" is selected with 04).

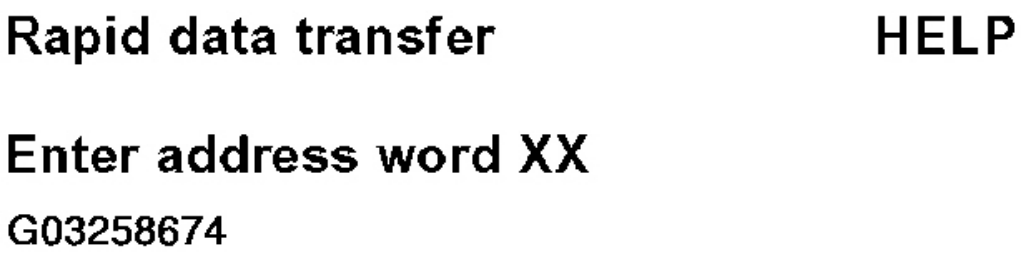


Fig. 251: V.A.G 1551 Scan Tool Display - Initiating Basic Setting (12 Of 40)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display:

- Confirm entry with key Q.

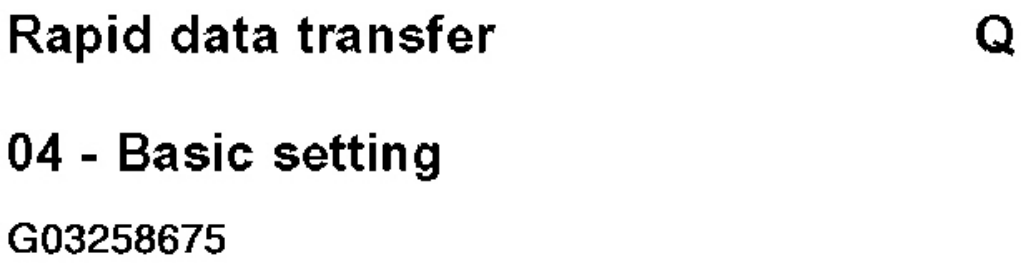


Fig. 252: V.A.G 1551 Scan Tool Display - Initiating Basic Setting (13 Of 40)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display:

- Press keys 0, 6 and 0
- Confirm entry with key Q.

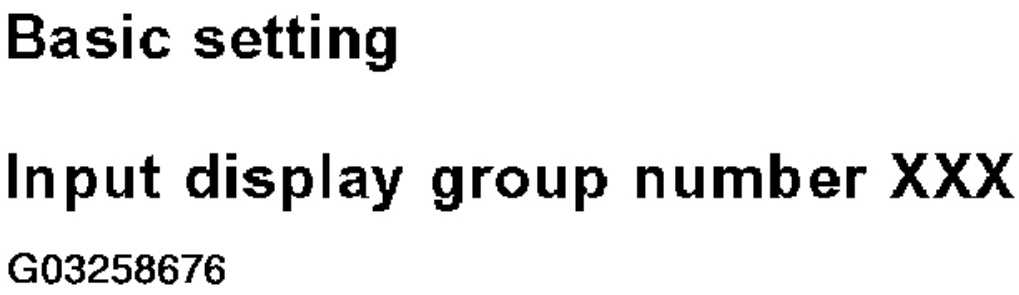


Fig. 253: V.A.G 1551 Scan Tool Display - Initiating Basic Setting (14 Of 40)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- ABS warning light flashes.

And then the display shows e.g.:

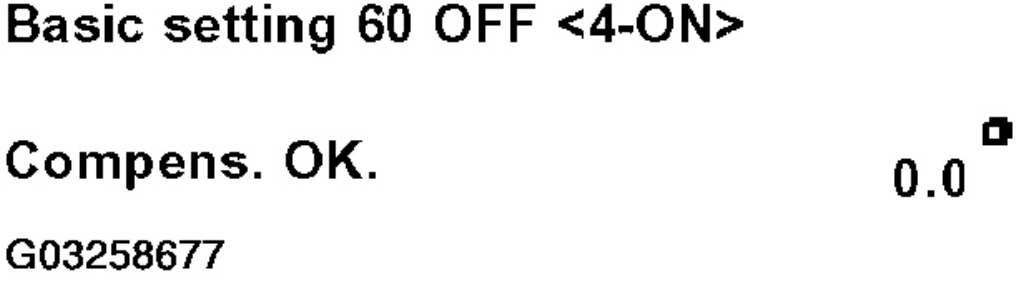


Fig. 254: V.A.G 1551 Scan Tool Display - Initiating Basic Setting (15 Of 40)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

If this display appears the login procedure has not been performed successfully.

- or:

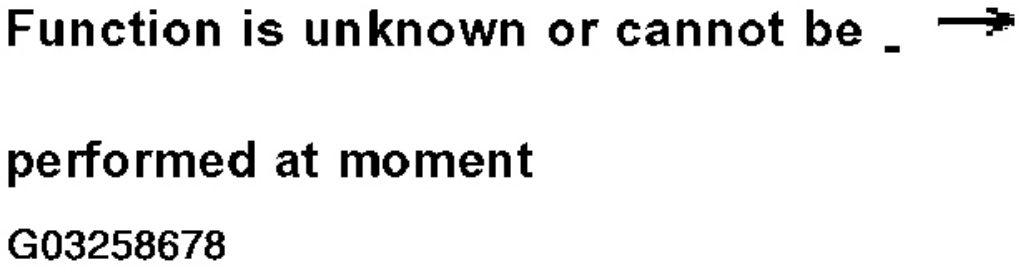


Fig. 255: V.A.G 1551 Scan Tool Display - Initiating Basic Setting (16 Of 40)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

If this appears in the display, the measured values for the zero compensation are not within the allowed tolerance.

- Check specifications with help of function 08 "Read measured value block" see **MEASURED VALUE BLOCK, READING** , Display group number 004.

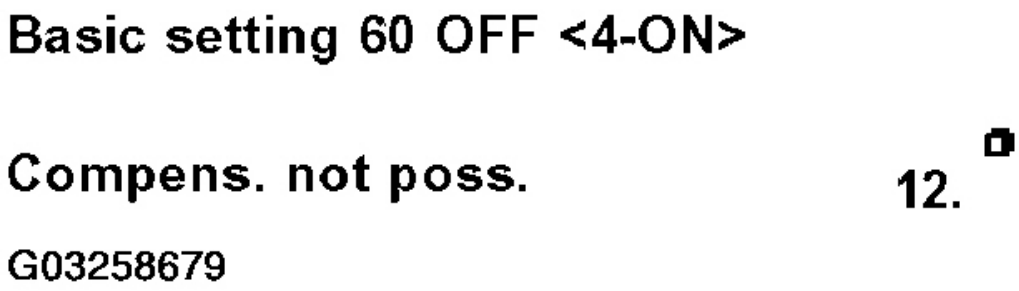


Fig. 256: V.A.G 1551 Scan Tool Display - Initiating Basic Setting (17 Of 40)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

1. Check DTC memory (Function 02)
2. Erase DTC memory (Function 05)
3. End output (Function 06)
4. Switch off ignition.
5. Switch on ignition.

6. Perform zero compensation again.

- Press --> key.

Indicated on display:

- Press keys 0 and 6, this ends the output.

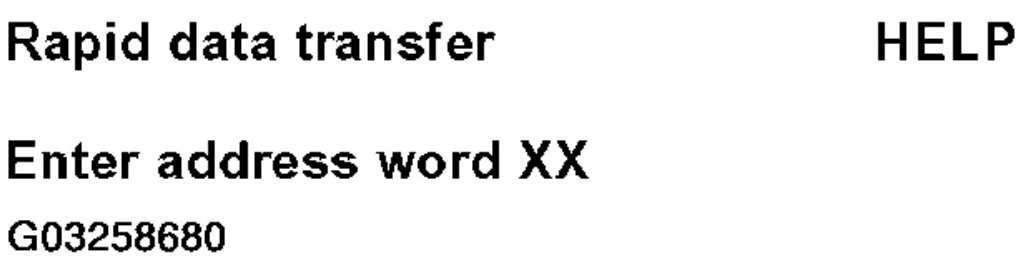


Fig. 257: V.A.G 1551 Scan Tool Display - Initiating Basic Setting (18 Of 40)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display:

ABS and ESP warning lamps light up for approx. 2 seconds.

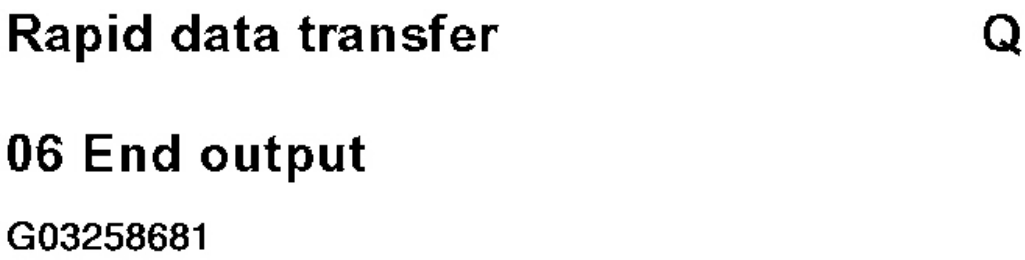


Fig. 258: V.A.G 1551 Scan Tool Display - Initiating Basic Setting (19 Of 40)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Display group number 063: Zero compensation of sensor for transverse acceleration -G200-

NOTE:

- **All functions which could previously be performed with V.A.G 1551 can now also be carried out with the tester VAS 5051.**

- Position the vehicle on a flat level surface.
- Connect V.A.G 1551 scan tool and select brake electronics control module with ignition switched on (address word 03); see **LIST OF SELECTABLE FUNCTIONS** .
- Check specifications with help of function 08 "Read measured value block" see **MEASURED VALUE BLOCK, READING** , Display group number 004.
- First perform function 11 "Login procedure" successfully using V.A.G 1551 scan tool, see **LOGIN PROCEDURE** .

Indicated on display:

- Press keys 0 and 4. (The function "Initiating basic setting" is selected with 04).

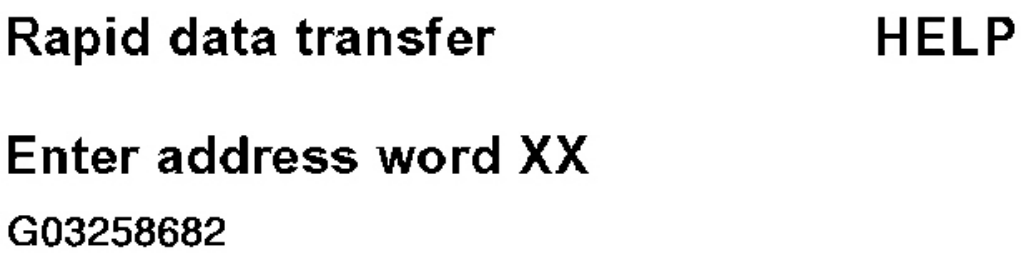


Fig. 259: V.A.G 1551 Scan Tool Display - Initiating Basic Setting (20 Of 40)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display:

- Confirm entry with key Q.

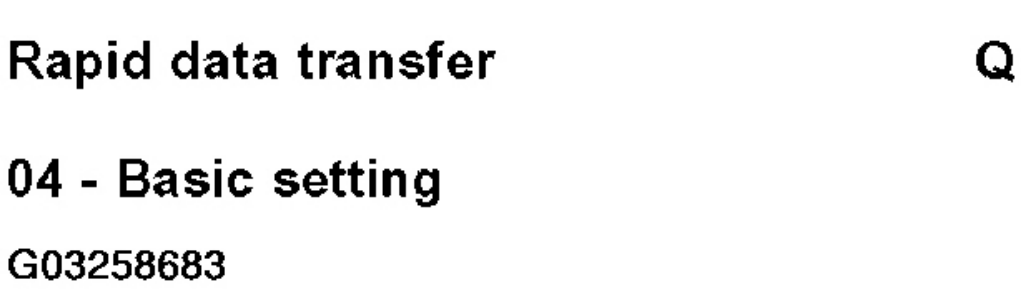


Fig. 260: V.A.G 1551 Scan Tool Display - Initiating Basic Setting (21 Of 40)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display:

- Press keys 0, 6 and 3
- Confirm entry with key Q.

  ABS warning light flashes.

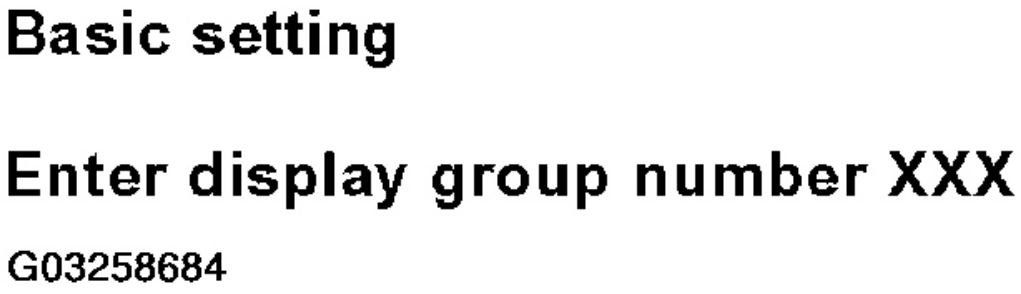


Fig. 261: V.A.G 1551 Scan Tool Display - Initiating Basic Setting (22 Of 40)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

And then the display shows e.g.:

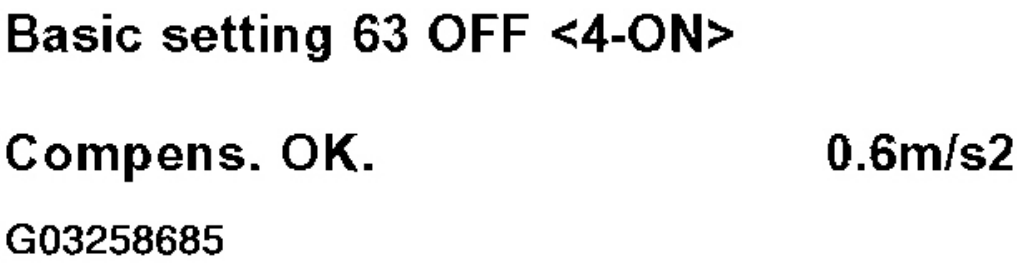


Fig. 262: V.A.G 1551 Scan Tool Display - Initiating Basic Setting (23 Of 40)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

If this display appears the login procedure has not been performed successfully.

- or:

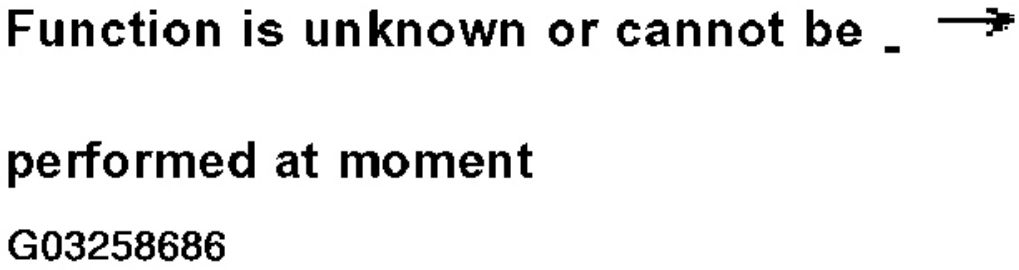


Fig. 263: V.A.G 1551 Scan Tool Display - Initiating Basic Setting (24 Of 40)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

If this appears in the display, the measured values for the zero compensation are not within the allowed tolerance.

- Check specifications with help of function 08 "Read measured value block" see **MEASURED VALUE BLOCK, READING** , Display group number 004.

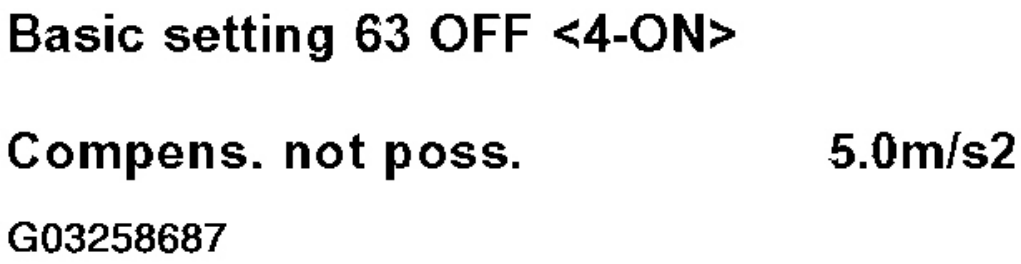


Fig. 264: V.A.G 1551 Scan Tool Display - Initiating Basic Setting (25 Of 40)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

1. Check DTC memory (Function 02)
2. Erase DTC memory (Function 05)
3. End output (Function 06)
4. Switch off ignition.
5. Switch on ignition.
6. Perform zero compensation again.

- Press --> key.

Indicated on display:

- Press keys 0 and 6, this ends the output.

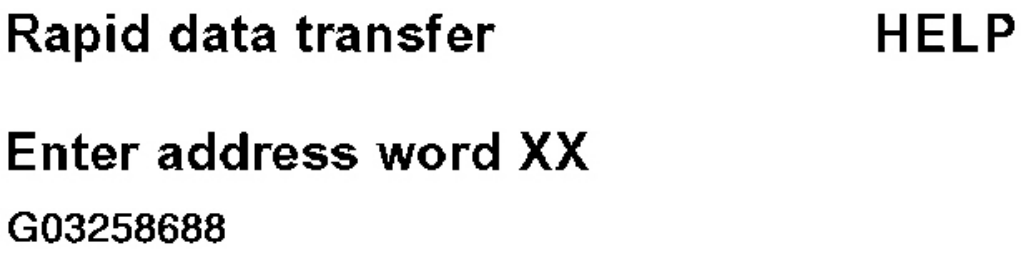


Fig. 265: V.A.G 1551 Scan Tool Display - Initiating Basic Setting (26 Of 40)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display:

ABS and ESP warning lights light up for approx. 2 seconds.

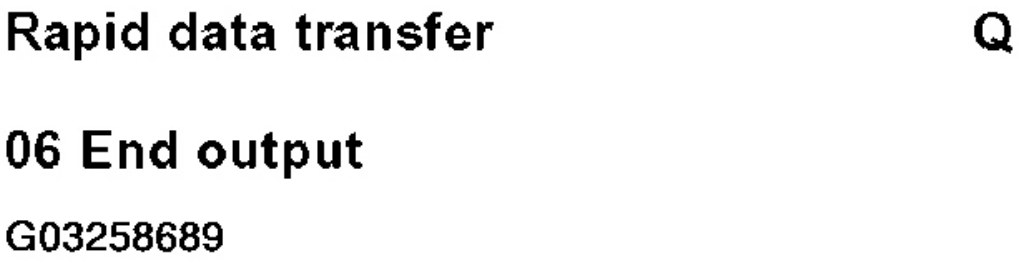


Fig. 266: V.A.G 1551 Scan Tool Display - Initiating Basic Setting (27 Of 40)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Display group number 66: zero compensation for brake pressure sender 1 -G201-

NOTE:

- **All functions which could previously be performed with V.A.G 1551 can now also be carried out with the tester VAS 5051.**

Do not depress brake pedal

- Connect V.A.G 1551 scan tool and select (address word 03) brake electronics control module with ignition switched on; see **LIST OF SELECTABLE FUNCTIONS** .
- Check measured values with help of function 08 "Read measured value block" see **MEASURED VALUE BLOCK, READING** , Display group number 005.
- Perform function 11 "Login procedure" successfully first using V.A.G 1551 scan tool, see **LOGIN PROCEDURE** .

Indicated on display:

- Press keys 0 and 4. (The function "Initiating basic setting" is selected with 04).

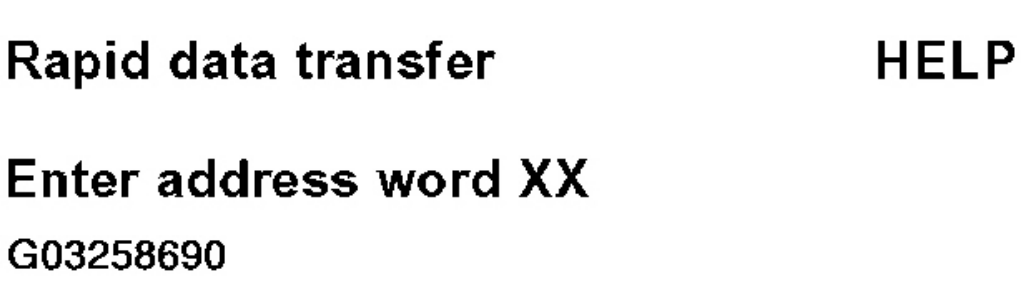


Fig. 267: V.A.G 1551 Scan Tool Display - Initiating Basic Setting (28 Of 40)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display:

- Confirm entry with key Q.

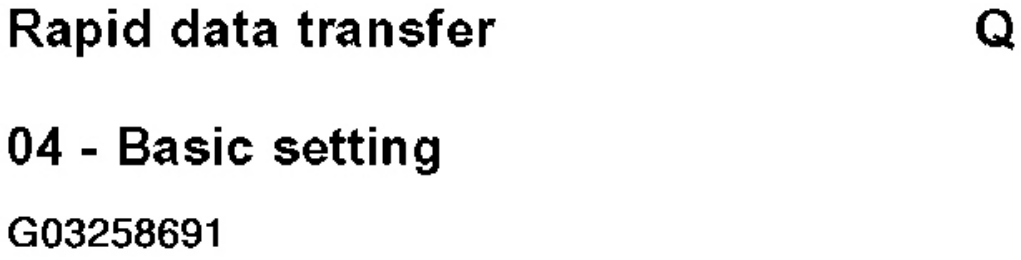


Fig. 268: V.A.G 1551 Scan Tool Display - Initiating Basic Setting (29 Of 40)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display:

- Press keys 0, 6 and 6
- Confirm entry with key Q.

  ABS warning lamp flashes.

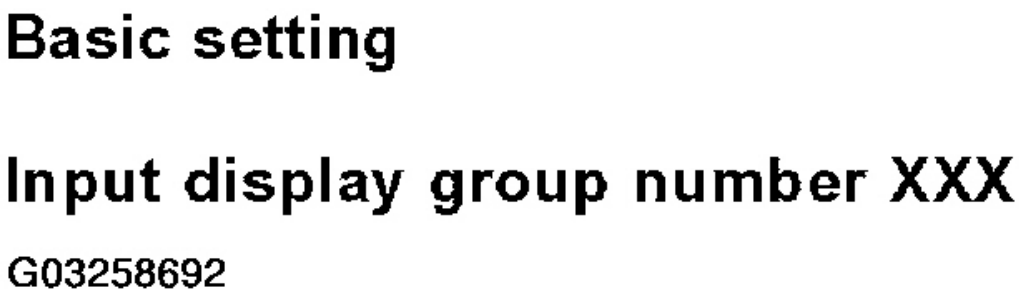


Fig. 269: V.A.G 1551 Scan Tool Display - Initiating Basic Setting (30 Of 40)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

And then the display shows e.g.:

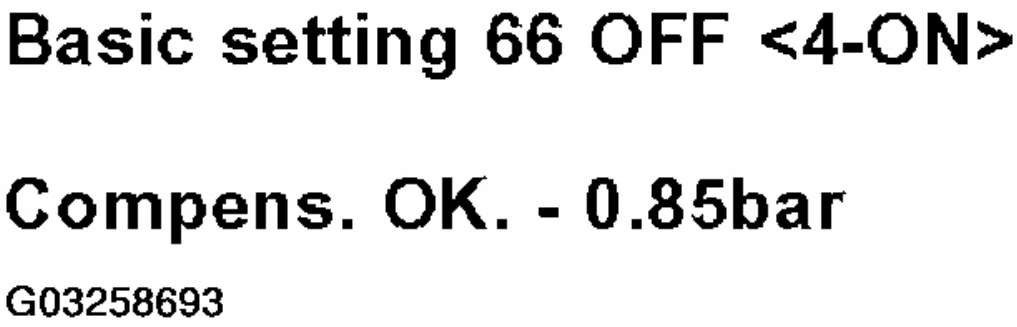


Fig. 270: V.A.G 1551 Scan Tool Display - Initiating Basic Setting (31 Of 40)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

If this display appears the login procedure has not been performed successfully.

- or:

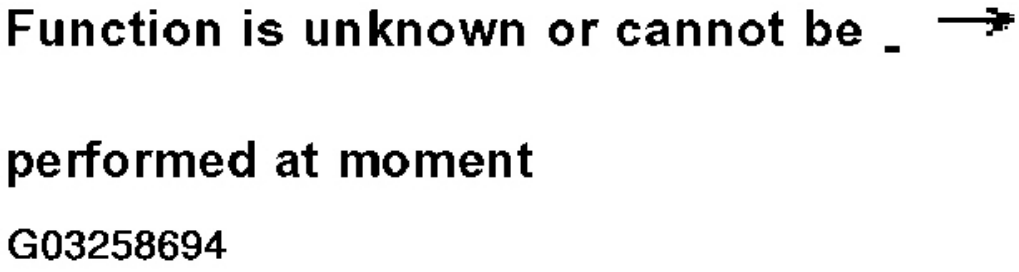


Fig. 271: V.A.G 1551 Scan Tool Display - Initiating Basic Setting (32 Of 40)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

If this appears in the display the measured values for the zero compensation are not within the allowed tolerances.

- Check measured values with help of function 08 "Read measured value block" see **MEASURED VALUE BLOCK, READING** , Display group number 005.

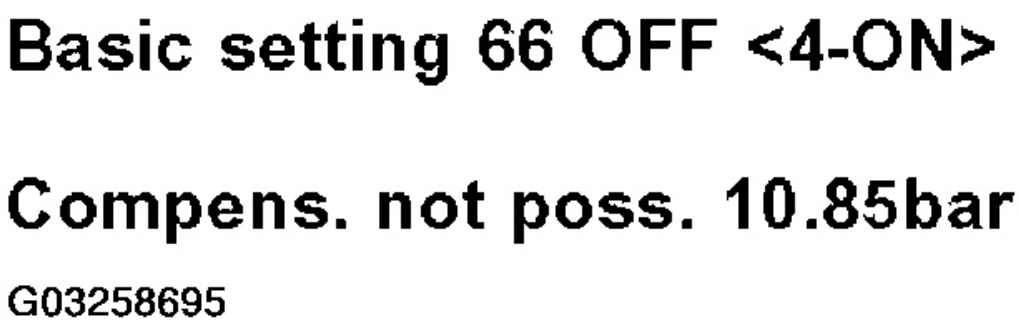


Fig. 272: V.A.G 1551 Scan Tool Display - Initiating Basic Setting (33 Of 40)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

1. Check DTC memory (Function 02)
2. Erase DTC memory (Function 05)
3. End output (Function 06)
4. Switch off ignition.

5. Switch on ignition.
6. Perform zero compensation again.

- Press --> key.

Indicated on display:

- Press keys 0 and 6, this ends the output.

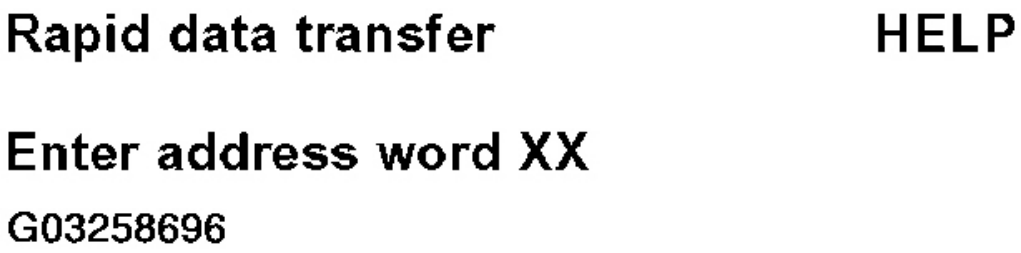


Fig. 273: V.A.G 1551 Scan Tool Display - Initiating Basic Setting (34 Of 40)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display:

ABS and ESP warning lights light up for approx. 2 seconds.

Fig. 274: V.A.G 1551 Scan Tool Display - Initiating Basic Setting (35 Of 40)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Display group number 93: activation of ESP driving test

The ESP driving test is used to check the plausibility of the signals from steering angle sensor -G85-, sensor for transverse acceleration -G200-, sender for rotation rate -G202- and sender 1 for brake booster -G201-.

The ESP driving test should be performed each time parts of the ESP system are removed or exchanged.

- Connect V.A.G 1551 scan tool and select (address word 03) brake electronics control module with ignition switched on; see **LIST OF SELECTABLE FUNCTIONS** .

Indicated on display:

- Press keys 0 and 4. (The function "Initiating basic setting" is selected with 04).

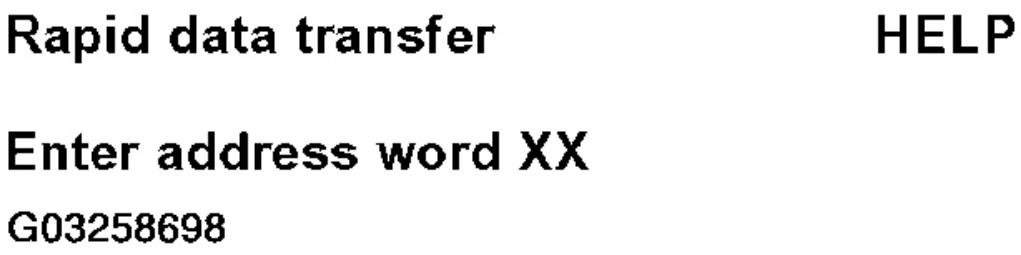


Fig. 275: V.A.G 1551 Scan Tool Display - Initiating Basic Setting (36 Of 40)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display:

- Confirm entry with key Q.

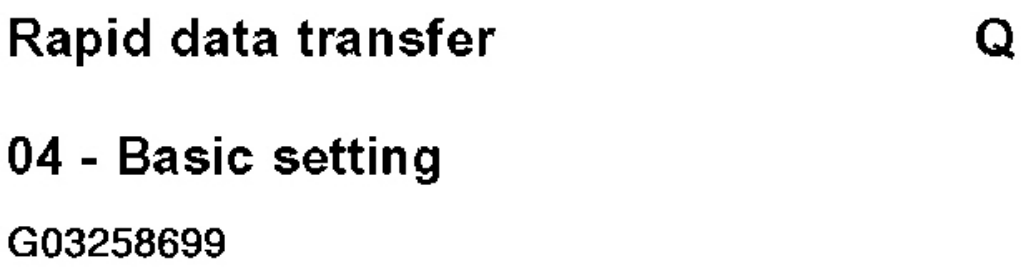


Fig. 276: V.A.G 1551 Scan Tool Display - Initiating Basic Setting (37 Of 40)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display:

- Press keys 0, 9 and 3

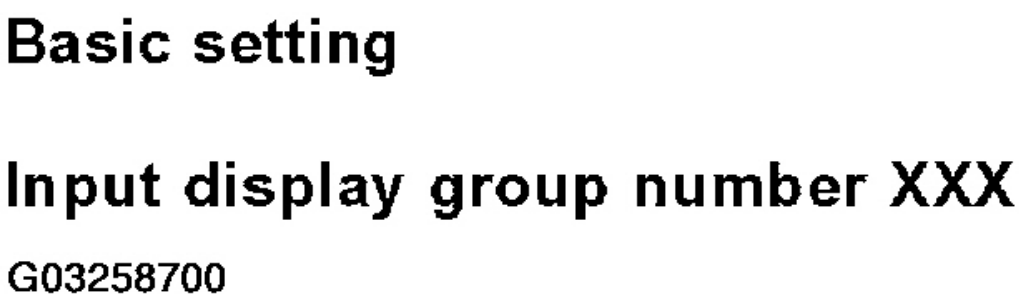


Fig. 277: V.A.G 1551 Scan Tool Display - Initiating Basic Setting (38 Of 40)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Confirm entry with key Q.

Indicated on display:

The ESP driving test is activated.

ABS warning lamp -K47- lights up.

- Press --> key.

Fig. 278: V.A.G 1551 Scan Tool Display - Initiating Basic Setting (39 Of 40)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display:

- Disconnect diagnostic connectors.
- Start engine.
- Depress brake pedal with substantial foot pressure (brake pressure more than 35 bar) until the ESP control lamp -K155- flashes.

  This completes the stationary comparison test.

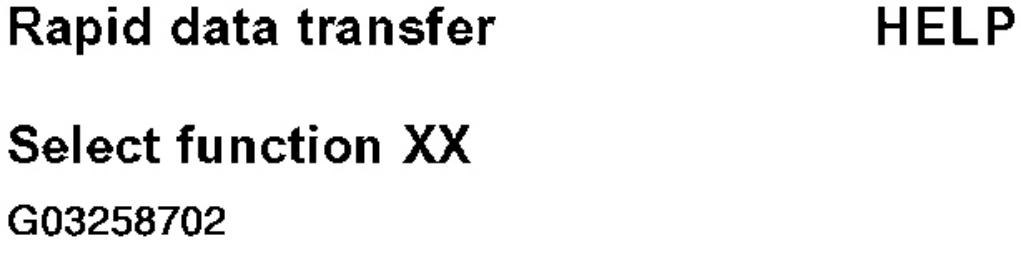


Fig. 279: V.A.G 1551 Scan Tool Display - Initiating Basic Setting (40 Of 40)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Now perform test drive for maximum 50 seconds at a speed of 15km/h to 30km/h:

  WARNING: Always comply with road traffic regulations and drive according to the traffic conditions.

- The test must be driven so that no ABS, EDL, ASR or ESP regulation is performed.
- Drive through a curve (turn) which is at least a 90° turn.

  The ABS warning light -K47- and the ESP Control Lamp -K155- go out, this successfully completes the ESP driving test.

  If the ABS warning light -K47- does not go out, then the ESP driving test has not been performed correctly.

- If the ABS warning light -K47- does not go out and the ESP Control Lamp -K155- lights up again, check DTC memory, see **DIAGNOSTIC TROUBLE CODE (DTC) MEMORY, CHECKING** .

LOGIN PROCEDURE

- All functions that have so far been carried out with V.A.G 1551 can now also be carried out with the tester VAS 5051.
- The login procedure can only be performed once per calibration.

Coding is only possible after the workshop code (WSC) has been introduced into V.A.G 1551 or the new tester VAS 5051.

Test sequence

- Connect V.A.G 1551 scan tool and select (address word 03) brake electronics control module with ignition switched on; see **LIST OF SELECTABLE FUNCTIONS** .

Indicated on display:

- Press key 1 and 1 (Function "Login procedure" is introduced with 11).

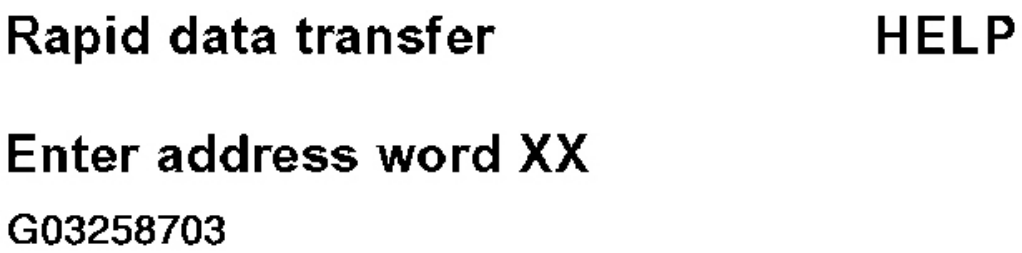


Fig. 280: V.A.G 1551 Scan Tool Display - Initiating Login Procedure (1 Of 4)

Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display:

- Confirm entry with key Q.

Fig. 281: V.A.G 1551 Scan Tool Display - Initiating Login Procedure (2 Of 4)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display:

- Enter code number 40168.
- Confirm entry with key Q.

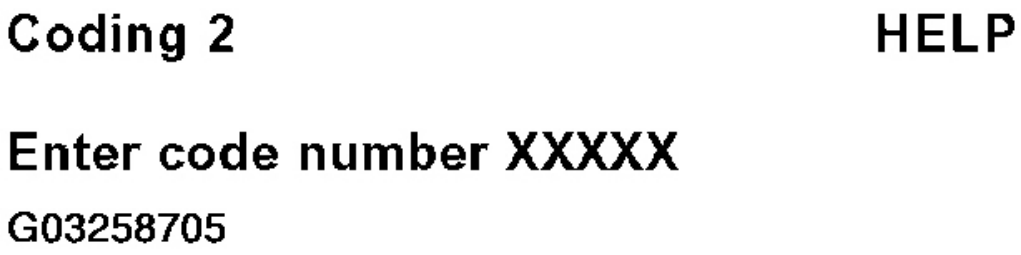


Fig. 282: V.A.G 1551 Scan Tool Display - Initiating Login Procedure (3 Of 4)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Indicated on display:

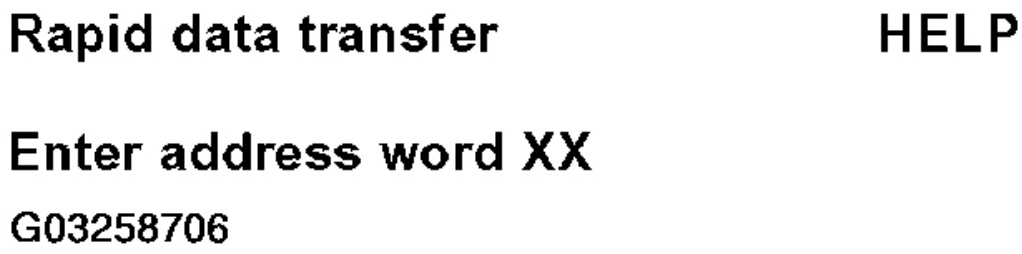


Fig. 283: V.A.G 1551 Scan Tool Display - Initiating Login Procedure (4 Of 4)
Courtesy of VOLKSWAGEN OF AMERICA, INC.

ELECTRICAL TEST OF MARK 60, VEHICLES FROM M.Y. 10.00

SPECIAL TOOLS AND EQUIPMENT

- VAG 1598/36 Adapter
- VAG 1594 A Adapter set
- VAG 1526 A Hand multimeter
- VAG 1921 Pliers
- VAG 1598 A Test box

Fig. 284: Identifying Special Tools And Equipment
Courtesy of VOLKSWAGEN OF AMERICA, INC.

NOTE: The test steps from, see TEST STEP OVERVIEW apply only to vehicles with ABS/EDL/ASR/ESP.

An overview of all the test steps in the electrical check can be found on **TEST STEP OVERVIEW** .

- For vehicles on which the On Board Diagnostic (OBD) does not give any indication of the source of the malfunction. Work through the complete electrical check.
- For vehicles on which the OBD provides a direct indication of the source of the malfunction. Only carry out the test steps recommended in the DTC table (directed entry).

Test prerequisites

- Before starting the test, switch ignition and all electrical consumers off (headlights, lighting, fans etc.).
- Fuses must be OK. (pull fuse out of holder to check)

- Pull fuse holder out of cable channel.
- Release ABS control module (w/EDL) -J104- connector -arrow- 1 and pull off -arrow 2-.

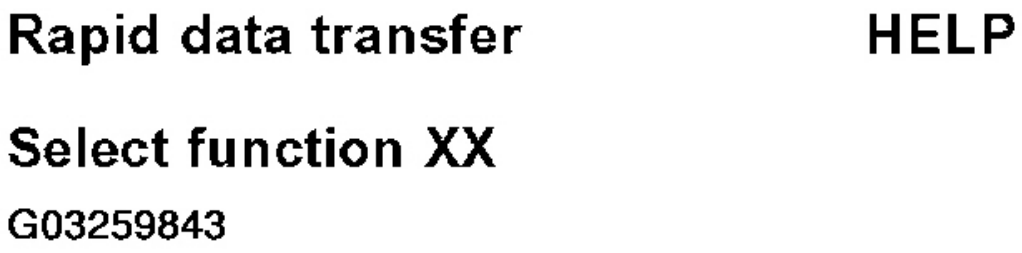


Fig. 285: Releasing ABS Control Module (W/EDL) -J104- Connector 1 And Pulling Off Connector
Courtesy of VOLKSWAGEN OF AMERICA, INC.

- Connect test box V.A.G 1598/36-1 to multi-pin connector of ABS control module (w/EDL) -J104-2-.

The specified values are matched to the VAG 1526 and are not necessarily applicable for other test modules.

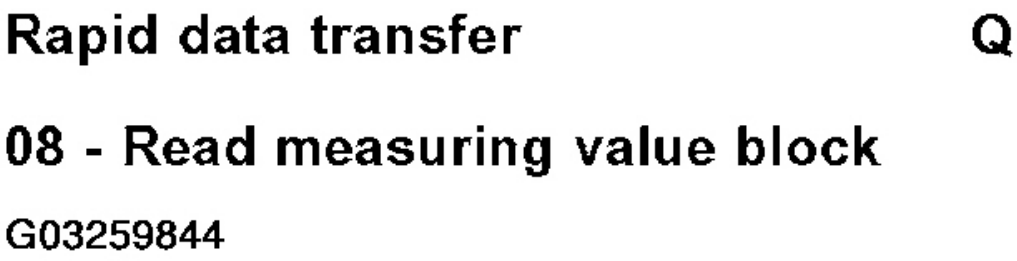


Fig. 286: Connecting Test Box V.A.G 1598/36-1 To Multi-Pin Connector Of ABS Control Module (W/EDL) -J104-2
Courtesy of VOLKSWAGEN OF AMERICA, INC.

MULTI-PIN CONNECTOR WITH CONTACT ASSIGNMENTS

NOTE: All contacts not listed are currently not assigned and must never be connected to other components!

Contact assignment of connectors for voltage supply and self-diagnosis with the V.A.G 1551 scan tool

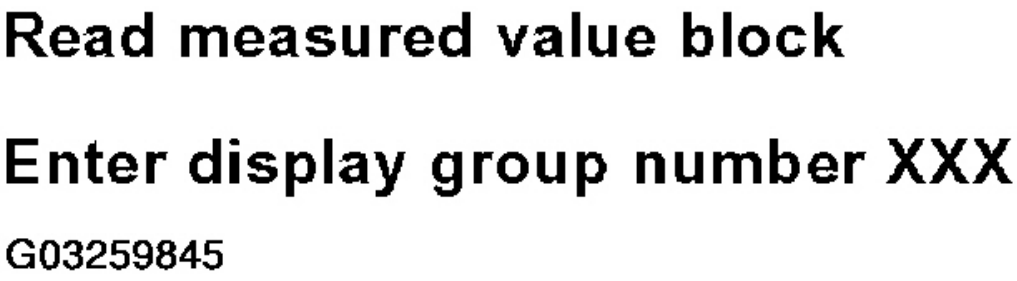


Fig. 287: Identifying Contact Assignment Of Connectors For Voltage Supply
Courtesy of VOLKSWAGEN OF AMERICA, INC.

Contact 4 = Ground (terminal 31)

Contact 16 = Positive (terminal 30)

Contact 7 = K-wire to contact 2 of ABS Control Module (w/EDL) -J104- multi-pin connector T47

Contact assignment of connector T47 wiring harness/ABS control module (w/EDL) -J104-.

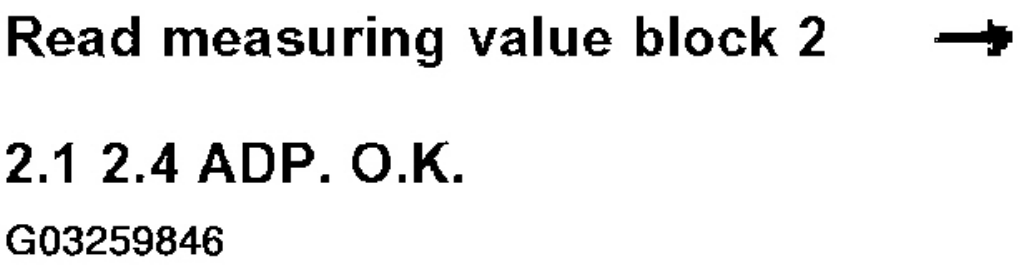


Fig. 288: Identifying Contact Assignment Of Connector T47 Wiring Harness/ABS Control Module (W/EDL) -J104
Courtesy of VOLKSWAGEN OF AMERICA, INC.

TERMINAL ASSIGNMENT - T47 WIRING HARNESS/ABS CONTROL MODULE (W/EDL)

Contact	Wiring connection to component...
1	Voltage supply from battery +
2	Connector T16/7, K wire
3	Vacant
4	Voltage supply from ignition/starter switch
5	Vacant
6	Sensor for transverse acceleration -G200-
7	Vacant
8	Vehicles with navigation system only
9	Vacant
10	Vehicles with navigation system only
11	Data bus wire, see wiring diagrams
12	Coding bridge to contact 38
13	ASR/ESP button -E256-
14	Coding bridge to contact 38 (vehicles with ABS only)
15	Data bus wire, see wiring diagrams
16	Ground point on left-hand longitudinal member
17	Vacant
18	Sender 1 for brake booster -G201- voltage supply
19	Sender 1 for brake booster -G201- signal wire
20	Sender 1 for brake booster 1 -G201- Ground wire

21	Vacant
22	Vacant
23	Vacant
24	Ground wire for sensor for transverse acceleration -G200- and sender for rotation rate -G202- Ground wire for ESP sensor unit -G419, vehicles from m.y. 12.01
25	Vacant Data bus wire for ESP sensor unit -G419-, vehicles from m.y. 12.01
26	Voltage supply for sensor for transverse acceleration -G200- and sender for rotation rate -G202-
27	Vacant
28	Vacant
29	Vacant Data bus wire for ESP sensor unit -G419-, vehicles from m.y. 12.01
30	Vacant
31	Vacant
32	Voltage supply from battery +
33	Right front ABS wheel speed sensor -G45-
34	Right front ABS wheel speed sensor -G45-
35	Vacant
36	Left rear ABS wheel speed sensor -G46-
37	Left rear ABS wheel speed sensor -G46-
38	Coding bridge to contact 12 (vehicles with ABS/EDL/ASR/ESP front wheel drive only) Coding bridge to contact 14 (vehicles with ABS front wheel drive only)
39	Vacant
40	Sender for Rotation Rate -G202- signal wire
41	Brake light switch -F-
42	Right rear ABS wheel speed sensor -G44-
43	Right rear ABS wheel speed sensor -G44-
44	Vacant
45	Left front ABS wheel speed sensor -G47-
46	Left front ABS wheel speed sensor -G47-
47	Ground point on left-hand longitudinal member

Test step overview

TEST STEP OVERVIEW

Component to be tested	Perform test step
Voltage supply for ABS hydraulic pump -V64- to ABS control module (w/EDL) -J104-	1
Voltage supply for valves in hydraulic unit -N55- to ABS control module (w/EDL) -J104-	2
Voltage supply (ignition/starter switch) to ABS control module (w/EDL) -J104-	3
Function of brake light switch -F-	4

Resistance of right front ABS wheel speed sensor -G45-	5
Resistance of left front ABS wheel speed sensor -G47-	6
Resistance of right rear ABS wheel speed sensor -G44-	7
Resistance of rear ABS wheel speed sensor -G46-	8
Voltage signal of right front ABS wheel speed sensor -G45-	9
Voltage signal of left front ABS wheel speed sensor -G47-	10
Voltage signal of right rear ABS wheel speed sensor -G44-	11
Voltage signal of left rear ABS wheel speed sensor -G46-	12
Warning lamp function for ABS warning light -K47-	13
Warning lamp function for warning light for brake system -K118-	14
Warning lamp function for ESP amp -K155-	15
Function of ASR/ESP button -E256-	16
Activation of steering angle sensor -G85-	17
Activation of sensor for transverse acceleration -G200- Activation of sender for rotation rate -G202-	18
Activation of sender 1 for brake booster -G201-	19
Checking data bus wiring	20
Voltage supply for V.A.G 1551, connector T16	-21
Resistance of K wire for self-diagnosis, connector T16	22
Coding bridge	23
Coding bridge	24

TEST TABLE (TEST STEPS 1-16)

Test steps 17 - 24 ohm see, see TEST TABLE (TEST STEPS 17-24)

Notes on test table

- The socket designations of adapter V.A.G 1598/36 are identical to the ABS control module (w/EDL) -J104- contact designations in wiring diagram.
- If the readings obtained deviate from the specifications, carry out malfunction repair measure in the right-hand part of the table.

  See

- Continuity checks with adapter set V.A.G 1594 A (bridging).
- If the measured figures only deviate slightly from the specifications, clean sockets and plugs of the testers and adapter cables (with contact spray G 000 700 04) and repeat check. Before replacing components, check wiring and connections and also, particularly for specifications of less than 10 ohm, repeat resistance check on the component.

VOLTAGE MEASUREMENT (20 V =)

Switch to measuring range:

Voltage measurement (20 V =)					
Test step	**V.A.G 1598 sockets**	**Item tested**	• **Test conditions** ○ **Additional operations**	**Specification**	**Measures for deviations from specification**
1	1 + 47	Voltage supply for ABS hydraulic pump -V64- to ABS control module (w/EDL) -J104-	• Ignition switched off	10.0 - 14.5 V	• Check wiring using wiring diagram
2	32 + 16	Voltage supply for the valves in the ABS hydraulic unit -N55- to ABS control module (w/EDL) -J104-	• Ignition switched off	10.0 - 14.5 V	• Check wiring using wiring diagram
3	4 + 47	Voltage supply (terminal 15) for ABS control module (w/EDL) -J104-	• Ignition switched on	10.0 - 14.5 V	• Check wiring using wiring diagram
4	47 + 41	Function of brake light switch -F-	• Ignition switched off • Brake pedal not depressed	0.0 - 0.5 V	• Check brake light switch -F- and rear measured value block, see **MEASURED VALUE BLOCK, READING** , display group number 003
					• Check wiring using wiring diagram
			• Depress brake pedal	Approx. battery voltage	• Check brake light switch -F-, see **ADJUSTING BRAKE LIGHT SWITCH**
5	33 + 34	Resistance of right front ABS wheel speed sensor -G45-	• Ignition switched off	1.0 - 1.3 k ohm	
					• Check wiring using wiring diagram
					• Wiggle wiring during test
					If no malfunction can be

					located in the wiring:
					• Replace right front ABS wheel speed sensor -G45-
					See **ABS SYSTEM COMPONENTS ON FRONT AXLE, REMOVING AND INSTALLING** .
6	45 + 46	Resistance of left front ABS wheel speed sensor -G47-	• Ignition switched off	1.0 - 1.3 k ohm	
					• Check wiring using wiring diagram
					• Wiggle wiring during test
					If no malfunction can be located in the wiring:
					• Replace left front ABS wheel speed sensor -G47-
					See **ABS SYSTEM COMPONENTS ON FRONT AND REAR AXLE, REMOVING AND INSTALLING** .
7	42 + 43	Resistance of right rear ABS wheel speed sensor -G44-	• Ignition switched off	1.0 - 1.3 k ohm	
					• Check wiring using wiring diagram
					• Wiggle wiring during test
					If no malfunction can be located in the wiring:
					• Replace right rear ABS wheel speed sensor -G44-
					See **ABS SYSTEM COMPONENTS ON FRONT AND REAR AXLE,**

					REMOVING AND INSTALLING .
8	37 + 36	Resistance of left rear ABS wheel speed sensor -G46-	• Ignition switched off	1.0 - 1.3 k ohm	
					• Check wiring using wiring diagram
					• Wiggle wiring during test
					If no malfunction can be located in the wiring:
					• Replace left rear ABS wheel speed sensor -G46-
					See **ABS SYSTEM COMPONENTS ON FRONT AND REAR AXLE, REMOVING AND INSTALLING** .
9	33 + 34	Voltage signal for right front ABS wheel speed sensor -G45-	• Vehicle raised • Ignition switched off		• Check installation of right front ABS wheel speed sensor -G45- and rotors
			• Rotate front right wheel at approx. 1 rev./sec.	Min. 65 mV alternating voltage	• Check whether right front ABS wheel speed sensor -G45- has been interchanged and read measured value block. See **MEASURED VALUE BLOCK, READING** , Display group number 001
10	45 + 46	Voltage signal for left front ABS wheel speed sensor -G47-	• Vehicle raised • Ignition switched off		• Check installation of speed sensor -G47- and rotors
			• Rotate front left wheel at approx. 1 rev./sec.	Min. 65 mV alternating voltage	• Check whether left front ABS wheel speed sensor -G47- has been interchanged and read measured value block.

					See **MEASURED VALUE BLOCK, READING** , display group number 001
11	42 + 43	Voltage signal for right rear ABS wheel speed sensor -G44-	• Vehicle raised • Ignition switched off		• Check installation of right rear ABS wheel speed sensor -G44- and rotor.
			• Rotate rear right wheel at approx. 1 rev./sec.	Min. 190 mV alternating voltage	• Check whether right rear ABS wheel speed sensor -G44- has been interchanged and read measured value block. See **MEASURED VALUE BLOCK, READING** , Display group number 001
12	37 + 36	Voltage signal for left rear ABS wheel speed sensor -G46-	• Vehicle raised • Ignition switched off		• Check installation of left rear ABS wheel speed sensor -G46- and rotors
			• Rotate rear left wheel at approx. 1 rev./sec.	Min. 190 mV alternating voltage	• Check whether left rear ABS wheel speed sensor -G46- has been interchanged and read measured value block, see **MEASURED VALUE BLOCK, READING** , Display group number 001

FUNCTIONAL CHECK: ABS WARNING LIGHT K47

Functional check: ABS warning light -K47-					
Test step	**V.A.G 1598 sockets**	**Item tested**	• **Test conditions** ○ **Additional operations**	**Specification**	**Measures for deviations from specification**
13	-	Function of ABS warning light -K47-	• Ignition switched off ○ Switch ignition on	ABS warning light -K47- lights up for approx. 2 seconds and then goes out again	• Check wiring using wiring diagram
					• Malfunction in

					instrument cluster
					See **INSTRUMENT CLUSTER FROM 06.99 & UP , ON BOARD DIAGNOSTIC (OBD)** .

FUNCTIONAL CHECK: WARNING LIGHT FOR BRAKE SYSTEM K118

Functional check: Warning light for brake system -K118-					
Test step	V.A.G 1598 sockets	Item tested	• Test conditions ○ Additional operations	Specification	Measures for deviations from specification
14	-	Function of warning light for brake system - K118-	• Parking brake not pulled on • Brake fluid level is OK • Ignition switched on	Warning light for brake system - K118- does not light up	• Check wiring using wiring diagram
			• Pull parking brake on	Warning light for brake system - K118- lights up	• Malfunction in instrument cluster See **INSTRUMENT CLUSTER FROM 06.99 & UP , ON BOARD DIAGNOSTIC (OBD)** .

FUNCTIONAL CHECK: STABILITY PROGRAM WARNING LAMP K155

Functional check: Stability program warning lamp -K155-					
Test step	V.A.G 1598 sockets	Item tested	• Test conditions ○ Additional operations	Specification	Measures for deviations from specification
15	-	Function of ESP Control Lamp - K155-	• Ignition switched off • Switch ignition on	Warning lamp - K155- lights up for approx. 2 seconds and then goes out again	• Check wiring referring to wiring diagram
					• Malfunction in instrument cluster See **INSTRUMENT**

					CLUSTER FROM 06.99 & UP , ON BOARD DIAGNOSTIC (OBD) .

FUNCTIONAL CHECK: WARNING LAMP FOR ASR/ESP BUTTON E256

Functional check: warning lamp for ASR/ESP button -E256-					
Test step	V.A.G 1598 sockets	Item tested	• Test conditions ○ Additional operations	Specification	Measures for deviations from specification
16	-	Function of ASR/ESP button -E256-	• Ignition switched on • The function of the ESP Control Lamp -K155- was checked in test step 15.	ESP Control Lamp -K155- lights up for 2 seconds and goes out again	
			• ASR/ESP button -E256- depressed	ESP warning lamp -K155- lights up.	• Check wiring referring to wiring diagram
			• Depress ASR/ESP button -E256- again	ESP warning lamp -K155- goes out.	
			ASR/ESP button -E256- faulty	• Replace ASR/ESP warning lamp -E256-	See **INSTRUMENT CLUSTER** .

Test table (test steps 17-24)

VOLTAGE MEASUREMENT IN TEST STEP 17 (20 V =)

Switch to measuring range: **Voltage measurement in test step 17 (20 V =), resistance measurement in test step 17a (200ohm/20 M ohm)**					
Test step	V.A.G 1598 sockets	Item tested	• Test conditions ○ Additional operations	Specification	Measures for deviations from specification
17	-	Voltage supply for steering angle sensor -G85-	• Ignition switched off ○ Disconnect connection from steering angle sensor -G85-		
			• Disconnect multi-pin connection T47 from ABS control module (w/EDL) -J104-		
			• Check wiring between contact	10.0 - 14.5	• Check wiring

			T6a/4 and contact T6a/1 of steering angle sensor -G85-.	V	referring to wiring diagram
17	-	Voltage supply for steering angle sensor -G85-	• Ignition switched on • Check wiring between contact T6a/5 and contact T6a/1 of connector from steering angle sensor -G85-	10.0 - 14.5 V	• Check wiring referring to wiring diagram

RESISTANCE MEASUREMENT (200ohm/20 M ohm)

Continuation of test step 17a					
Switch to measuring range: Resistance measurement (200ohm/20 M ohm)					
Test step	V.A.G 1598 sockets	Item tested	• Test conditions ○ Additional operations	Specification	Measures for deviations from specification
17a		Wiring for steering angle sensor -G85-	• Measuring range set to 200 ohm		
			• Ignition switched off		
			• Connect test box V.A.G 1598/36		
			• Check wiring for open circuit between steering angle sensor -G85- and ABS control module (w/EDL) -J104- multi-pin connector	Max. 1.5 ohm	• Check wiring using wiring diagram
17a		Wiring for steering angle sensor -G85-	• Set measuring range to 20 M ohm		
			• Remove fuse S9		
			• Check wiring for short circuit to positive or ground	"INFINITY" ohm	• Check wiring using wiring diagram

RESISTANCE MEASUREMENT (200 ohm/20 M ohm)

Switch to measuring range: Resistance measurement (200 ohm/20 M ohm)					
Test step	**V.A.G 1598 sockets**	**Item tested**	• **Test conditions** ○ **Additional operations**	**Specification**	**Measures for deviations from specification**
18	-	Wiring for sensor for transverse acceleration - G200- and sender for rotation rate - G202-	• Ignition switched off • Measuring range 200 ohm selected ○ Connect test box V.A.G 1598/36		
			• Check wiring for open circuit between sensor for transverse acceleration -G200-, sender for rotation rate -G202- and multi-pin connector for control module -J104-	Max. 1.5 ohm	• Check wiring using wiring diagram
			• Select measuring range 20 Mohm • Remove fuse S9 • Check wiring for short circuit to positive or ground	INFINITY Ohms	

RESISTANCE MEASUREMENT (200 ohm/20 M ohm)

Switch to measuring range: Resistance measurement (200 ohm/20 M ohm)					
Test step	**V.A.G 1598 sockets**	**Item tested**	• **Test conditions** ○ **Additional operations**	**Specification**	**Measures for deviations from specification**
19	-	Wiring for sender 1 for brake booster - G201-	• Ignition switched off • Measuring range set to 200 ohm ○ Disconnect connection from sender 1 for brake booster - G201-		
			• Disconnect multi-pin connection T47 from ABS control module (w/EDL) -J104-		

			• Connect test box V.A.G 1598/36		
			• Check wiring for open circuit between sender 1 for brake booster -G201- and multi-pin connector for ABS control module (w/EDL) -J104-	Max. 1.5 ohm	• Check wiring using wiring diagram

RESISTANCE MEASUREMENT (200 ohm/20 M ohm)

Switch to measuring range: Resistance measurement (200 ohm/20 M ohm)					
Test step	**V.A.G 1598 sockets**	**Item tested**	• **Test conditions** ○ **Additional operations**	**Specification**	**Measures for deviations from specification**
19			• Select measuring range 20 M ohm		
			• Remove fuse S9		
			• Check wiring for short circuit to positive or ground	"INFINITY" ohm	• Check wiring using wiring diagram

RESISTANCE MEASUREMENT (200 ohm/20 M ohm)

Switch to measuring range: Resistance measurement (200 ohm/20 M ohm)					
Test step	**V.A.G 1598 sockets**	**Item tested**	• **Test conditions** ○ **Additional operations**	**Specification**	**Measures for deviations from specification**
20	11 or 15	Data bus wiring	• Ignition switched off • Measuring set range to 200 ohm		
			• Disconnect multi-pin connection from a control module which is connected via data bus wiring:		
			• Connect test box V.A.G 1598/36		
			• Check data bus wiring for open circuit	Max. 1.5 ohm	• Check wiring using wiring diagram

RESISTANCE MEASUREMENT (200 ohm/20 M ohm)

Switch to measuring range: **Resistance measurement (200 ohm/20 M ohm)**					
Test step	**V.A.G 1598 sockets**	**Item tested**	• **Test conditions** ○ **Additional operations**	**Specification**	**Measures for deviations from specification**
20			• Select measuring range 20 M ohm		
			• Remove fuse S9		
			• Check wiring for short circuit to positive or ground	"INFINITY" ohm	• Check wiring using wiring diagram

RESISTANCE MEASUREMENT (200 ohm/20 M ohm)

Switch to measuring range: **Resistance measurement (200 ohm/20 M ohm)**					
Test step	V.A.G 1598 sockets	Item tested	• Test conditions ○ Additional operations	Specification	Measures for deviations from specification
21	-	Voltage supply for V.A.G 1551, connector T16 1)	• Ignition switched off ○ Multimeter V.A.G 1526 connected to T16(1) using cables from auxiliary test set V.A.G 1594.	10.0 - 14.5 V	• Check wiring using wiring diagram
(1) Diagnosis connector contact assignment, see **MULTI-PIN CONNECTOR WITH CONTACT ASSIGNMENTS** .					

RESISTANCE MEASUREMENT (200 ohm)

Switch to measuring range: **Resistance measurement (200 ohm)**					
Test step	**V.A.G 1598 sockets**	**Item tested**	• **Test conditions** ○ **Additional operations**	**Specification**	**Measures for deviations from specification**
22	-	Resistance of	• Ignition switched off	Max. 1.5	• Check

		K-wire for V.A.G 1551, connector T16[1)]	• Disconnect multi-pin connector from ABS control module (w/EDL) -J104-.		wiring using wiring diagram
			• Connect test box V.A.G 1598/36		
			• Connect hand multimeter V.A.G 1526 to contacts T16/7[1)] and T47/2[2)] of multi-pin connector from ABS control module (w/EDL) -J104- using cables from auxiliary test set V.A.G 1594		

(1) Contact assignment for diagnosis connector, see **MULTI-PIN CONNECTOR WITH CONTACT ASSIGNMENTS** .

(2) Contact assignment for control module connector, see **MULTI-PIN CONNECTOR WITH CONTACT ASSIGNMENTS** .

RESISTANCE MEASUREMENT (200 ohm)

Switch to measuring range:
Resistance measurement (200 ohm)

Test step	V.A.G 1598 sockets	Item tested	• Test conditions ○ Additional operations	Specification	Measures for deviations from specification
23	12 + 38	Coding bridge for ABS/EDL/ASR/ESP	• Ignition switched off	0.0 - 1.0 ohm	• Check wiring using wiring diagram.

RESISTANCE MEASUREMENT (200 ohm)

Switch to measuring range:
Resistance measurement (200 ohm)

Test step	V.A.G 1598 sockets	Item tested	• Test conditions ○ Additional operations	Specification	Measures for deviations from specification
24	14 + 38	Coding bridge for ABS	• Ignition switched off	0.0 - 1.0 ohm	• Check wiring referring to current flow diagram.

ADJUSTING BRAKE LIGHT SWITCH

NOTE: Remove brake light switch to adjust.

- Disconnect connector off brake light switch.
- Remove brake light switch by turning 45° to the left.
- Before installing, pull plunger fully out.
- Guide brake light switch through assembly opening and reinstall by pressing against the pedal and turning 45° to the right.

  Brake pedal always remains in rest position.

- Install brake light switch connector.
- Check function of brake light.

After adjusting brake light switch, make sure the brake pedal is in the end stop position (released position).

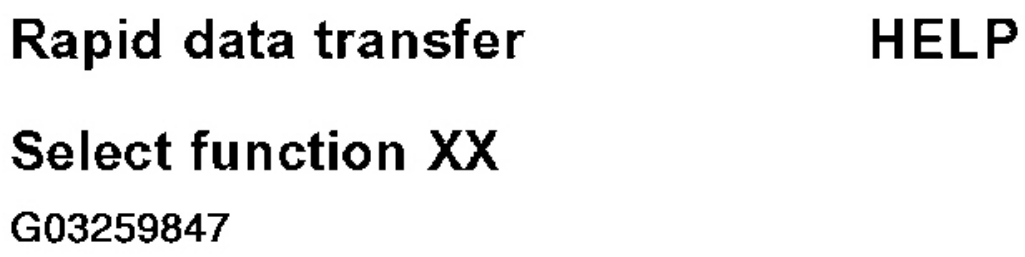


Fig. 289: Removing Brake Light Switch By Turning 45° To Left
Courtesy of VOLKSWAGEN OF AMERICA, INC.

DEFINITIONS

These explanations concern this assembly group: Self-diagnosis for ABS. These definitions are not necessarily generally valid.

ABS/EDL/ASR/ESP

Anti-lock braking system, electronic differential lock, traction control system, electronic stability program.

Display group number, see Read measured value block

ASR (Traction control system)

Further information on this can be found in the appropriate Self-study program No. 115.

Booster

Brake servo

Data bus

Transportation of data. To do this the electrical signals are brought into a certain format (BUS). Further information on this can be found in Self-study programs No.180 and 186.

Data bus low (high)

The voltage used to transport the data is low (high). Further information on this can be found in self-study program no. 186.

Speed sensor

Sends speed signals to control module.

EBD

Electronic brake pressure distribution

Forget-malfunction counter

When a fault gets in the memory fault counter, after 50 vehicle starts, and this fault is not repeated again, the memory counter erases the fault.

Self-diagnosis

The capability of the control module:

- Recognise Diagnostic Trouble Codes (DTCs),
- React to DTCs,
- Store DTCs,

and make them available in the measured value block. Further information on this can be found in Self-study program and test module instruction manual.

Performing self-diagnosis

Connecting the Scan Tool to be able to check the DTC memory. Further information on this can be found in Self-study program and test module instruction manual.

Performing electrical check

A targeted check of the electronic components by performing certain measurements.

ESP

Electronic stabilization program

ESP-Sensor Unit -G419-, vehicles from m.y. 12.01

The sensor for transverse acceleration -G200-, and the sender for rotation rate -G202- are assembled together in a housing.

Sender 1 for brake booster/sensor -2- for brake pressure -G201/-G214-

Registers the pressure exerted by the driver and is required to control the pressure of the pre-charge pressure (booster).

Sender for rotation rate -G202-

Registers the rotational movement of the vehicle along the vertical axis relative to the speed of the vehicle.

Steering angle sensor -G85-

Used to determine the direction the driver desires. Data transfer to control module is via the data bus wiring.

Sensor for transverse acceleration -G200-

Used to register the speed through curves/bends and which side should be braked using the ESP.

No communication

There is no connection for exchanging information between the control modules. Further information on this can be found in Self-study program No. 180.

Short to ground

Current flows -incorrectly- to ground without supplying a consumer.

Short to positive

Current flows -incorrectly- to a live component without supplying a consumer.

Trip switch

The trip switch is located in the brake booster and is used by the control module to determine the braking desired by the driver which then leads to the switch-off of the brake pressure (booster) solenoid valve.

Magnetic coil for brake pressure, in brake booster -N247-

The brake pressure (booster) solenoid valve is located in the brake booster and is used to provide the pressure required for the pre-charging (by increasing the suction pressure) for the ABS/ESP pump.

Read measured value block

The control module can transfer a considerable amount of test data. This test data delivers information on the operational condition of the system and/or sensors connected to it. In many cases the transferred test data supports fault finding and fault rectification. The test data has been summarized into single display groups because all the information cannot be evaluated at the same time. The information can be selected via display group numbers.

EBC

Engine braking control

Program card version

Always use the most up-to-date program card. Further information can be found in the test module operating instructions.

Sporadic

Happens occasionally

Infinity ohm

The resistance is infinite, open circuit.

"INFINITY" Ohms